



TEBBIT... "US strains at every gnat but allows hornets through."

Tebbit urges UK independence

by George Black
TRADE and Industry Secretary of State Norman Tebbit has urged Britain to aim for technological independence of the US, unless the current trade dispute is settled.

He was addressing the North American section of the London Chamber of Commerce last week.

The US practice of extra-territoriality — imposing its own export regulations overseas — had strengthened the argument for a British capability under British control in strategic fields, said Tebbit. He added: "As a second best, Britain should turn to another country with indigenous technology and without pretensions to extra-territorial jurisdiction."

The implication seems to be that if agreement is not reached over

exports, Britain should forge closer links with either Europe or Japan, at the expense of the Americans.

Tebbit urged Congress to help reduce tension between the two countries by approving amendments which would curtail their extra-territorial claims in the new Export Administration Bill.

A joint House-Senate bill is to be drafted by a committee mediating between the hawk and dove in the US Congress.

Tebbit stressed that Britain had not gone soft on preventing the flow of high technology to the Eastern Bloc. But he said that there were suspicions that US policy favoured the commercial advantage of US companies rather than the shared strategic objectives of the allies.

The US appeared to be establishing "an edifice of control which strains at every gnat but allows the more dangerous hornets to get through."

He was referring to attempts by US officials to clamp down on the trade in microcomputers.

He said he had been encouraged during his recent visit to Washington to find "very real concern" within the US administration over the spread of protectionism. A civil service team is continuing discussions with the Americans to try to reach an understanding.

Tebbit returns to the US in May with a visit to the West Coast. He will promote export opportunities for UK firms and investment in British industry and is expected to make a trip to Silicon Valley.

Academics protest — page 3.

Olivetti puts money in Japan firm

OLIVETTI has made its first venture capital investment in Japan just two months after selling a 25% stake to American Telephone & Telegraph. The Italian maker of office automation equipment is investing £500,000 for 20% of the equity of Dixy, a Japanese maker of displays for terminals and work stations.

See OTC'84 free

ORGANISERS of the first exhibition devoted to the growing Over the Counter (OTC) stock market are offering free admission to the event to *Computer Weekly* readers. London's OTC market is an increasingly significant source of equity finance for small high-risk, high-return companies, and the 1984 OTC Exhibition is aimed at both potential OTC companies and investors. The exhibition will run Friday, March 16, and Saturday March 17, at Glaziers Hall, London Bridge, London SE1. Take along this copy of *Computer Weekly* for free admission. An OTC Conference is running simultaneously: reservations cost £3; details on 01-629 4288.

Computastore

ENTRIES close next Monday (March 19) for the 1984 Computastore contest. Details and entry forms appeared in the February 16 and 23 issues of *Computer Weekly*, and teams wishing to enter one of the four UK heats should contact Gordon Cairns on 01-688 6690 as soon as possible.

Teradyne in UK

US telecommunications manufacturer Teradyne has opened its first overseas factory at Bracknell. It employs 35 people now, and will expand to several hundred by 1986, making microprocessor-controlled test systems. The Boston firm turned over \$251 million last year, up from \$175 million in 1982, with profits of \$21 million.

Tetra sales soar

HIGH WYCOMBE distributor Tetra sold £3.25 million worth of Fortune systems and software during 1983, netting £250,000 profit. Tetra, one of two UK distributors of Fortunes equipment, also sells Unix-based Tetrafin financial applications to run on the high-powered US micros. Director Gordon Skinner claims it has been an outstandingly successful year.

Second for Intel

THE acute shortage of microprocessor chips has spurred Intel into a second source agreement for its 80186 with Advanced Micro Devices. Manufacturing data has been transferred; Advanced Micro Devices expects to start production at the end of the year. Demand for the chip, says Intel, will be 10 times that for any previous Intel processor. It can be used to build computers compatible with the IBM-PC.

Academics protest at access to information

by John Riley
TWO eminent academic institutions have expressed concern about the increasing US squeeze on information transfer which is beginning to cause headaches for British researchers.

The Committee of Vice-Chancellors and Principals has written to the British Embassy in Washington and also to UK ministries to outline general fears among British academics that access to information is being restricted.

A spokesman for the Committee of Vice-Chancellors says one of the

problems is that non-US nationals have been precluded from certain conferences which can be freely attended by US citizens, on the grounds of security.

The Royal Society has also voiced its worry about restrictions on information transfer.

Dr Ronald Keay, executive secretary of the Royal Society, says: "There are no specific examples, but things have become more difficult over the past 18 months. It is a general worry and our discussions have been on general grounds."

Professor John Ashworth, vice-

chancellor of Salford University, but speaking in his capacity as chairman of the National Economic Development Office (NEDO) IT Section, agrees that "there has been a noticeable change in the last 18 months which is extremely worrying for the UK."

"A significant amount of evidence is accumulating but people are reluctant to give specific instances."

The US export laws are wide-ranging and include intellectual knowledge as well as physical

machinery or software.

An internal discussion document leaked last year by ICL stated: "If ICL employs an American engineer to write a report or a piece of software, that report or software is controlled under US law — and the end use to which that report or software is also controlled. ICL has in fact had to obtain US export licences to cover knowledge carried in the heads of American engineers."

Tebbit speaks out on technology transfer — page 2.



ASHWORTH... "Change is extremely worrying for UK."

SPL recruits boss from rival Logica

by John Kavanagh
SYSTEMS and software firm SPL International has appointed a new managing director from rival Logica to boost marketing and take it into the US.

Dr Dil Faulkes has come in after 12 years with Logica, recently as head of the US operation. David Thomson, a financial man, has moved up from managing director to chairman and chief executive, and a new financial director, Simon Westbrook, has been brought in from outside the industry.

This reshuffle and change of emphasis follows SPL's most successful year yet. Turnover grew 20% to £12 million. And the company moved from losses into a profit expected to be about £1 million.

Towards the end of the year the Canadian television and radio company Western Broadcasting, which owned 60%, bought the other 40% from the UK government's British Technology Group.

That buy-out, giving SPL strong North American backing, plus Faulkes' appointment, mean



THOMPSON... Moved up.

It expects to do 25% of its UK business through third parties this year. Last year its UK turnover was £26 million. Worldwide business totalled \$420 million.

Survey sees tougher times ahead for many micro firms

by Keith Holder
THE microcomputer market is becoming a tough place to survive — and will get tougher, according to a market research report by Technology Intelligence.

It predicts that, as competition heats up, 40% of current suppliers will go bust in the period 1984-88 and one in three micro companies will not survive two years.

It estimates that the UK market for micros will grow by an average 46% a year, and the market will move from being hardware driven to software driven.

These figures are close to an earlier estimate by the Economist Intelligence Unit, which predicted a 52% growth rate and a market value of \$2.3 billion by 1987.

The report also says that 70% of today's machines will not be in production by 1986.

National Computing Centre (NCC) spokesman Bill McCool says that he thinks the Technology Intelligence report is close to the mark.

"It highlights the same situation that existed earlier, with mainframes," he adds. "Only the number of companies and the scale are much larger for the micro market."

He predicts that the main criteria for sorting out the winners from the losers will be what operating systems are used by a particular machine, and that only 10 or 12 manufacturers will be left by 1988.

Chairman of the British Micro Manufacturers Group, David Broad, agrees, but says although the attrition rate for micro companies will be high, there will be new firms setting up almost at the same rate.

He adds: "The figures given are open to interpretation. We might see the micros of today disappear only because they are replaced with new models."

He points to his own company, Comart, as an example. It now has sales for its most recent 16-bit system exceeding those of its original eight-bit machine, though Broad adds that the older machine has a future.

The report goes on to say that the smaller manufacturers and distributors will be forced to look for specialisations not catered for by large volume manufacturers, like IBM, in order to secure themselves a future.

Broad describes this attitude as "over-simplistic," pointing out that the small business market alone will supply sufficient scope for low volume manufacturers of micros.

He adds: "I don't expect to see any fewer manufacturers in the future than we have now, though they may not be the same companies we see now."

Large corporations may find themselves at a disadvantage in this market, he adds, as they will find it more difficult to respond to the sudden changes the micro mar-

ket has displayed in the past.

Russ Nathan, managing director of Romtec, thinks the distributors may have the roughest time over the next few years.

He says a directory compiled by Romtec shows that up to one-tenth of the distributors in business at the beginning of the year have folded.

He also warns that companies should not pay too much heed to market growth forecasts, and adds: "People seem to expect the growth to follow a straight line whereas, in reality, it has peaks and troughs."

Nathan thinks the report's conclusion about a software driven market is on target.

He says users are becoming more interested in what software programs will run on a particular machine, and less about the machine itself.

"This is a very healthy trend. Users can see packages perform in their own environment, and it will do much to help the micro penetrate vertical markets," he concludes.

The Micro Business, An Examination of the UK Home, Personal and Small Business Computer Market 1984-1988, Price £55.

Fujitsu grabs 49% of Amdahl

by Keith Holder
JAPANESE electronics giant Fujitsu has increased its stake in Amdahl, the US plug-compatible manufacturer, to nearly 50%, following its purchase of shares held by venture capitalist Heizer.

The agreement, signed last week, is for Fujitsu to acquire six million shares, worth about \$190 million, making its holding to 49.6%.

The move has opened the floodgates for a wave of speculation about Amdahl's future as an independent manufacturer, although the relationship between the two companies goes back some 10 years.

Such fears are groundless, says Bryan Little, Amdahl UK managing director, the development is designed only to strengthen the companies' relationship, he says. He adds that an agreement, to

be signed soon, will include a declaration by Fujitsu that it will not acquire any more shares in the company, a statement it needed to satisfy the US Securities Exchange Commission (SEC).

The exact share-out of three seats on the board, vacated by Heizer, has not been agreed yet, says Little, but it is expected Amdahl will take two and Fujitsu one.

Fujitsu already has three seats, so this result would give Amdahl an overall majority on the board for the first time in its history — "hardly the position one would expect if we were being taken over," says Little.

A more plausible reason, given by industry watchers, is that Fujitsu, conscious of its vulnerability as a non-American supplier in the US market, wants to position itself to sell its products under the Amdahl name. Its main rival, Hitachi,

already does this through its distributor National Advanced Systems. Fujitsu has already announced plans to build a new plant in the US to avoid anti-Japanese discrimination of its disc products (see page 8).

It is also rumoured that Amdahl is worried by the prospects of IBM's high-powered Sierra mainframe range, expected in November, which would require it to upgrade its existing 580 series, or launch a new system, to maintain performance advantage.

The ability to outperform IBM's machines is a crucial factor for plug-compatible manufacturers if they are to compete effectively.

Fujitsu, on the other hand, has been reported as having a new generation of "supercomputers" up its sleeve, which could provide Amdahl with its answer to Sierra.

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Stockbroker Greene tips four for the top

by George Black
LOGICA, Rolfe and Nolan, Technology for Business and Miles 33 are the four hot tips for investors from stockbroker Greene & Co.

Its 1983 survey of prospects in the computing services sector published recently picks these four systems houses as chief recommendations for British investors out of 50 organisations investigated.

On Logica, Greene writes: "The high rating is not out of line with that accorded to other specialist software houses. They should not be omitted from any high technology portfolio at current prices."

It adds that the main growth will be in products, not in its traditional areas of consultancy and turnkey projects.

Re-rating of City-based Rolfe and Nolan is long overdue, says Greene. Profits have been held back by substantial expenditure on software development, but this has been fully incurred and written off. From May it will be selling turnkey systems in this country and abroad.

Technology for Business has been overshadowed by trading as a subsidiary of the French firm Lo-

gabax. But the brokers feel it is now on a sound financial footing and its dividend yield is one of the highest to be found in the sector. The company is market leader for solicitors' systems and has enormous growth potential, according to the report.

Miles 33 established itself as a field leader in computerised typesetting and the brokers say that it is 18 months to two years ahead of its rivals. The costs of developing the system have been written off, and there has been intense marketing over the past year, particularly in Europe. Marketing will begin in the coming year in the US, the biggest market by far.

Of the 50 firms reviewed, 44 showed positive growth and 20 improved over 25% in the year.

A report by Inter Company Comparisons of London lists the fastest-growing UK computer services firms as consultancy Mancos Holdings, Rolfe and Nolan and peripherals vendor Zygol Dynamics. Datasream has the most profitable employees, followed by Rolfe and Nolan. Highest paid staff on most recent data are at Rand Information Services (average £16,325) and BIS (£15,067).

Storage ships in IBM rival

by Keith Holder
STORAGE Technology, the biggest supplier of plug-compatible disc systems in the world, has shipped its first IBM 3380 contender, the 8380, into the UK.

This marks the beginning of a concerted effort by the company to break into the European market for 3380 disc systems, which helped push IBM's peripheral sales to a record figure last year.

Geoff Benjamin, acting managing director of Storage Technology, says: "There is a market in Europe for about 20,000 3380-type disc systems this year, and we are determined to get our fair share."

The race is now on among the plug-compatible manufacturers to grab the biggest slice of this market, with National Advanced Systems (NAS) and Storage Technology both claiming to be ahead at the moment.

Memorex and Amdahl are also contenders in this field, though Amdahl's system will not be released until the end of the second quarter this year. This will be a device made by Fujitsu, which the Japanese company has been selling into its home market, with some success, for several months already.

Benjamin concedes that IBM will remain the biggest supplier by a large margin but adds: "There is enough opportunity for all the plug-compatible suppliers to get a lot of sales from what is left."

The 8380, unlike IBM's system which at present only runs under MVS/XA, will run under most IBM mainframe operating systems. There are two disc control units available with the 8380, a standard controller, the 8880, and a cache memory controller, the 8890. The latter, however,

uses older technology, in common with the IBM 3350.

This could be a disadvantage if IBM follows up its announcement of a new model 3380, which will run under the DOS operating system instead of the usual MVS/XA, and discontinue manufacture of its 3350, according to Steve Muxworthy, peripherals products manager for NAS.

NAS, which markets Hitachi's 3380 plug-compatible system, the 7380, plans to introduce a cache controller, utilising current 3380 technology, this summer.

NAS shipped its first system into the UK in June last year, and now has installed a base of 26 units. Storage Technology's first system only went live last month, though Benjamin says: "We are confident that we can maintain our market position this year, and expect shipments in the hundreds."

MPs doubt Registrar's status

by our Parliamentary Correspondent
AMENDMENTS designed to ensure that the Data Protection Registrar will be independent of the government were moved during the Data Protection Bill's committee stage by SDP MP Robert Maclean.

Maclean is worried about the power in Schedule 2 of the Bill for the Home Secretary to control the size of the Registrar's budget and staff, set out in Section 2 of the Bill.

David Waddington, minister of state at the Home Office, defended the government's control over the Registrar's manpower and expenses. The Bill already did much to guarantee the Registrar's independence, said Waddington, but it would be irresponsible to give the

person too free a rein over public funds.

However, Labour MPs said they were unhappy that the Registrar did not have more powers to investigate complaints by people who suspected that data files concerning themselves were being misused. The MPs wanted the Registrar to take the initiative in investigations.

The Data Protection Bill was also indirectly connected with a question in the Commons put by Michael Meacher, Labour front bench spokesman.

He wanted to know for what purpose a Ministry of Defence installation in Mayfair had been connected to a national network of computers and terminals.

Some of the details of this MIS computer had been revealed by the



New Scientist recently.

Leon Brittan, the Home Secretary, replied that it had been the practice of successive governments not to comment on the use of computers for national security.

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US service giant turns to products

by John Kavanagh
A MAJOR reshuffle at the top of US services giant University Computing Company and a \$44 million cash injection has confirmed that the \$153 million company is moving into applications software products in a big way.

Its new applications products division has been given equal status to the mainstay systems software division. And president Allen Huff has resigned after 15 years with the company — nine months after takeover specialist Gregory Liemant joined as chairman.

Meanwhile in Europe the company is considering further takeovers in the microcomputer applications field.

It moved into applications products in the autumn with a \$21 million double takeover. First it went for Open Systems, a US firm with accounting packages for eight-bit and 16-bit microcomputers. Then it bought banking software firm Financial Software of America.

These moves followed the arrival of Liemant from services firm Geico — which took over several software companies in the early 1980s. He organised a \$25 million share issue specifically to fund takeovers. Since the first two deals the main shareholder has put up another \$24 million and provided a

further \$20 million research and development loan.

"We're now evaluating the European opportunities for the micro products," says Mike Cocks, head of Software Products International.

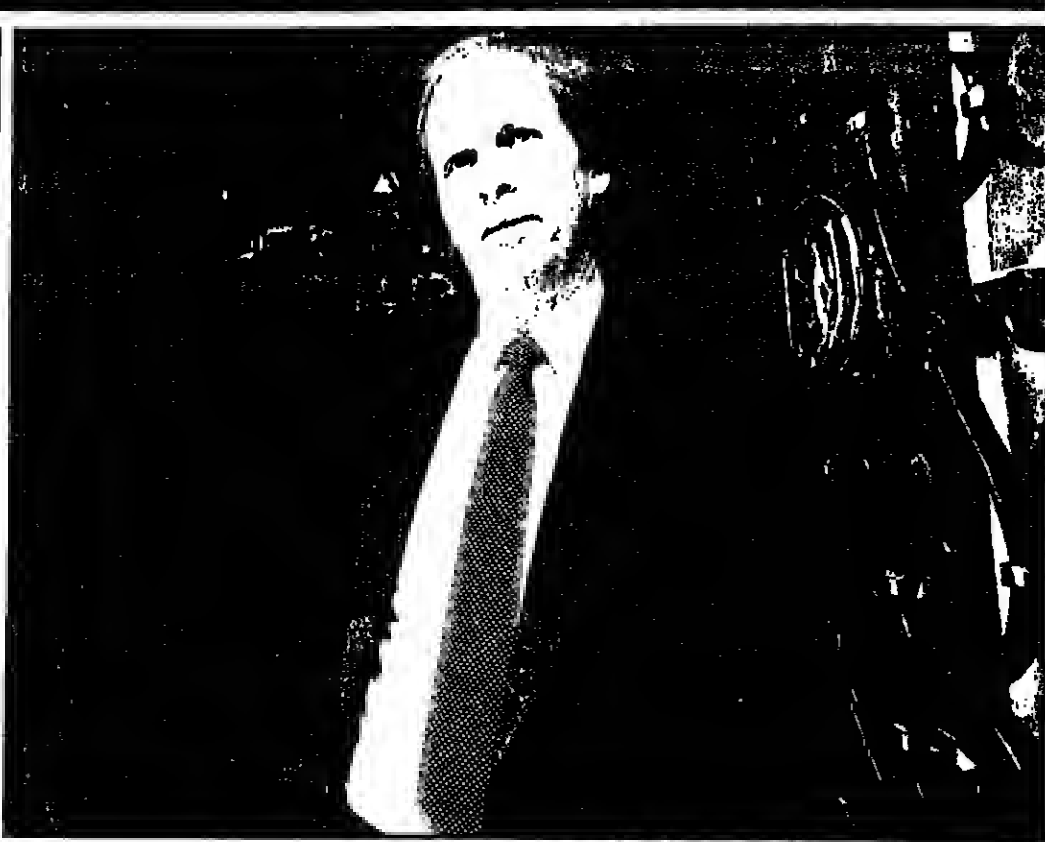
"It could well involve acquisitions of applications companies — and the UK would be the spearhead as it's the fastest-growing market."

"If we go ahead we will expect micro products to make a big contribution, so we'll certainly do it in a big way."

Cocks says that since Open Systems was bought, its annual revenues have grown from \$6 million in 1983 to a projected \$16 million this year.

Huff, who was made president a year ago, left amicably, Cocks says. "Greg Liemant is a very dynamic individual with a very strong personality and his own way of doing things," he says.

After a poor end to 1982 and start to 1983 University Computing has reported a profit of \$190,000 for the year. It was hit by the generally poor state of the bureau business and by the write-off of its unprofitable hardware OEM side. Fourth quarter profits of \$1.2 million show the company recovered in the second half of the year.



O'BRIEN... "It is hard to persuade good software people to go into maintenance."

Thorn-EMI forms new arm

by Philip Hunter
ELECTRONICS giant Thorn-EMI last week moved into computer maintenance by setting up a 90 strong firm aimed particularly at the business micro market.

The new company, Thorn-EMI Computeraid Services, will provide third party maintenance of installed micro and minicomputer systems and peripherals, and will also offer a quality control service to manufacturers and importers.

The company has set up in Farnborough, and is headed by Maurice O'Brien, previously general manager of the firm's Software

Sciences Hardware Maintenance division. Predicted first year turnover is £2½ million.

O'Brien says that the micro maintenance and service market is potentially vast, and is ready to be opened up by the right sort of marketing.

But one problem facing the new company, says O'Brien, is the difficulty in hiring good software maintenance staff. "It is hard to persuade good software people to go into maintenance," he says.

Computeraid Services has opened engineering workshops in 10 UK cities as a base for a return-

to depot service to users, and its "Total Care" service for importers, OEMs and manufacturers.

Computeraid Services is a subsidiary of Thorn-EMI's Information Technology division, which expects to report turnover of £200 million for its year ending this month.

The group moved deeper into the software market by setting up Thorn-EMI Software, with 70 people in October 1983 to market financial and systems software.

The company also owns Software Sciences, which is involved in the UK Ada project.

Micro makers resist efforts to curb adverts

by Keith Holder
EXTRAVAGANT advertising claims made by computer companies should be curbed, and a new watchdog body set up to see that this happens, according to Peter Sinclair, managing director of Sinclair Consultants.

But the computer industry, including micro makers such as the (unrelated) Sinclair Research, has been quick to pour cold water on the idea.

"The small business systems industry is too often characterised by overselling and under performing," says consultant Peter Sinclair.

He suggests that instead of the present Advertising Standards Authority (ASA), there should be an independent body, under the guidance of the National Computing Centre (NCC), to keep a closer eye on the claims made by manufacturers for their products.

The NCC, however, does not agree. Director David Fairbairn says: "We don't see that a watchdog committee is necessary."

The advertising authority, in matters of high technology advertising, should take advice from informed sources."

The ASA says that it does take

advice on these matters, though a spokesman declined to name the sources it uses.

"Computer manufacturers are not our number one area of complaints anyway," he comments, "and we are satisfied that we are covering the area adequately."

Sinclair also points to the small "home" computer manufacturers as the most frequent transgressors of the advertising laws, describing their advertising as "too often resplendent with absurd hyperbole and unjustifiable superlatives".

Manufacturers do not agree, and think that Sinclair is being unfair.

A spokesman for Acorn Computers, which makes the BBC Micro, says that any complaint brought by the ASA has been taken very seriously, and remedied immediately.

These companies are adamant that they do not attempt to mislead. Brie Wilton, who handles Acorn's advertising campaigns and says: "Companies in the home computer market are selling a product that is way ahead of the customer who are buying these machines. Some translation is necessary and there are a few slips made between the brain and the mouth."

SALES BRIEF

Ferranti's CAM-X rakes it in

FERRANTI is at last making a return on its investment in computer-aided design and manufacturing systems, with orders for its CAM-X system now running at £1 million a month. The company's CAD/CAM arm, Ferranti Cete Graphics, took five orders in December 1983, including an export order from German engineering group Krauss Maffei for £200,000, and two orders totalling £450,000 from Vickers Defence Systems. The company is expected to announce a multi-million pound CAD/CAM order this week.

DPCE hardware

A HARDWARE maintenance contract worth £250,000 has gone to independent computer maintenance firm DPCE UK. The firm will be responsible for the maintenance of an ICL 2960 mainframe and associated peripherals over the next three years at the Cheltenham premises of Dowty Group Services.

Box office winner

LONDON-based Space Time Systems has won one of the largest contracts for computerised box office systems. The company is to install its Box Office Computer System (BOCS) at all theatre and exhibition venues owned by the City of Birmingham, including the National Exhibition Centre, in a £500,000 contract.

Cray goes to Italy

US supercomputer-maker Cray Research has announced its first order from Italy, and its fourth so far this year. Cineca, a consortium of 13 Italian universities, has ordered a Cray-1 M/200 worth \$6.4 million, to be installed at its data processing centre in Bologna for scientific research.

Stroud changes

STROUD Building Society is changing its equipment from bureau service, run by National Westminster Bank subsidiary Centreline, to its own in-house system based on an NCR 9300 computer. The Society has ordered a new version of NCR's Building Societies System developed by Quadra Computer Services.

ICL motor deal

ICL is to supply British Telecom's motor transport division with a nationwide processing network costing £2 million. The network, to be developed in the next six months, will include a System 25 mini at each of 10 regional transport offices, and a further 45 System 25s for the largest service centres.

Shipping contract

THORN-BMI subsidiary Software Sciences has taken a £100,000 order for its multi-user Wicat computer as part of an information system containing details of ships, cargo, movements and crew, and suppliers. The system installed will be the Wicat 220, designed by Seaimate Data Systems.

Senate stamp

THE Post Office has gone to Senate Computer Services, a subsidiary of the London-based Gordon & Gotch Computer Group, for a £370,000 order for processing and accounting system to manage its Philatelic Bureau's worldwide sales to stamp collectors. The system will run on the bureau's new Burroughs B6900 mainframe.

Nixdorf order

NIXDORF Computer, West Germany's biggest indigenous computer maker which recently went public to raise money for an assault on its domestic micro market, has taken an order from Banque Belgo-Zairoise for an 8870 mainframe.

Philips thinks the IBM office way

by Donald Kennett
DUTCH electronics giant Philips last week unveiled its strategy for office automation, Sophomation (Synergic Open Philips Office Automation), and revealed that it has gone firmly into the IBM camp.

The company's plan to combine office automation, networks and information systems is heavily based on IBM's document interchange and document content architecture as a method to adhere to the International Standards Organisation's Open System Interconnection standard.

The terminal which Philips hopes will become the backbone of the system, the P3100 which was announced last week, is compatible with the IBM-PC.

Gert Bindels, Philips data systems division managing director, says the IBM micro will become de facto standard for office automation within two years.

Philips' version was developed outside the Dutch conglomerate by a company Philips refuses to name, but is probably Corona Data Systems with its IBM-PC lookalike.

Philips will manufacture the workstations and will carry out its own further development. The company will aim its initial sales at its traditional banking market and intends to move on from there to tackle other financial markets such as insurance.

"It is an important part of our office automation strategy to make it easier for the customer to adapt to the Sophomation system," Bindels says.

Key elements of the Sophomation scheme are the document handling devices, the networking systems, together with the software applications and tools. The Memphis software generator is claimed to increase programmer productivity by 50% to 70%.

Many of the parts of Sophomation, such as the Sophonet and Sopholan wide-area and local networks, and the Megadoc multimedia document storage system launched last year, can be used as independent systems.

Two joint ventures are being set up with Control Data to develop and make mass storage drives and their media. A third joint venture with another unnamed partner will produce a low-cost multi-colour impact printer that will, according to Bindels, beat even the Japanese.

"You can have a 1½in disc that can hold as much as a floppy," he says, "but it will take years to get it reliable. We don't expect it to be in mass production before the 1990s."

Philips last week announced a 49% increase in net profit for the year, to 647 million guilders (£147 million), on sales that had increased by 7% to 46.2 billion guilders (£10.5 billion).



BINDELS... "We don't expect mass production before 1990."

NatSemi pays \$1.75m for fooling Pentagon

by Keith Holder
NATIONAL SEMICONDUCTOR (NatSemi) has admitted that it deceived the US government over reliability testing of components destined for military and aerospace use.

The admission followed a Grand Jury investigation and the filing of a 40-count indictment charging the company with falsifying test certificates.

NatSemi has agreed to pay \$1.75 million in damages and legal costs, and the US government case against it has been dropped.

The charges centred around components supplied between 1978 and mid-1981. NatSemi was disqualified as a supplier of military components for a short period in 1982, but company president Charles Spork says that since that time the company has added 32

products to the Department of Defence approved list and is one of only three suppliers to have its products certified for use in space.

Spork says that after the test irregularities were discovered, NatSemi applied strict controls to ensure all tests were carried out. A spokesman for the Northern California district attorney says the relatively small fine was the result of extensive plea bargaining. But according to Spork, the fact that the government did not find any instance of failure in the field of under-tested devices was the crucial point.

The company recently announced that Hewlett-Packard, which has reportedly criticised the quality of US semiconductors, has decided there is no further need to test NatSemi bipolar logic chips on delivery.

CAP signs Far East software deal

by Philip Hunter
APPLIED Communications, a US producer of software for electronic transfer of money, is to distribute its products in the Far East through a company half-owned by UK software house CAP.

The distribution agreement with Sime CAP of Singapore will make products available in the financial markets of Hong Kong, and elsewhere in the Far East.

The companies do not at present plan a tie-up in Europe. "Any UK involvement will be on general policy rather than technical," says Malcolm Nell, Applied's UK managing director.

Its biggest UK success to date was in 1982 with a contract to supply the Scottish Trustee Savings Bank with software to control its automatic teller machine (ATM) network controlled by Tandem hardware.

The company has also supplied a system to handle point-of-sale authorisation to Eurocard, based in Frankfurt.

But a disappointment for the company was the recent decision of the building societies not to go ahead with a shared ATM network. It was to supply the switching equipment for this contract.

The US firm, until recently supplied software only for Tandem's full-tolerant hardware.

Tandon lays off half its US workers

by Keith Holder
THE use of cheap manufacturing in the Far East has led US disc drive manufacturer Tandon to lay off half its US workforce and transfer manufacturing to its subsidiaries in India and Singapore.

And the company may also build a manufacturing plant in this country.

A spokesman for the company says the loss of around 1,400 workers in California will be compensated for by a massive recruitment drive at the new manufacturing facilities.

Sirjang Tandon, company president, says every effort was made to maintain production in California, but the price demands of the marketplace made this impossible to achieve.

The move will not affect workers in Europe and the UK, says a spokesman, who hints that Tandon is considering the UK as a possible new site for a manufacturing plant.

The move to the Far East will make the company better able to compete, and will benefit customers by offering more competitive prices, he adds.

Production at the new sites, some on a contract basis, is expected to start quickly.

There will be no shortage of products because of the move, the spokesman says.



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Half of VDU women had abnormal pregnancies

by John Riley

A STUDY of VDUs by the US National Association of Working Women reveals that over half of the 873 respondents suffer from eyestrain, exhaustion and muscle pain. The study also claims that over half of the 48 women using VDUs in a San Francisco airline reservation office who had become pregnant since 1979 had abnormal confinements.

The association, called 9 to 5, produced a report which has received wide coverage in the US computer press. The newspaper *Computerworld* says the sample of 48 pregnancies in San Francisco is small and that the defects could have been due to other factors, including nearby radioactive wastes.

In the UK, eyestrain and aches and pains are usually due to poor attention to ergonomic factors in the office and to minor correctable defects in vision, not noticed in a non-VDU environment, rather than to emissions from the machines themselves.

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Users turn to touch screens

by John Riley
THERE is an "explosive" growth in the demand for touch sensitive terminals, says the boss of Mellor, data, the UK manufacturer of off-the-shelf touch systems.

Geoffrey Mellor, managing director, says that the UK is now catching up with the US in user awareness of touch sensitive screens and that his sales of touch sensitive terminals have increased 20 times over the past year, particularly in the past few months.

Colchester-based Mellor, which distributes terminals and

printers, designs and manufactures touch systems for terminals and is shortly to announce a touch system for several makes of terminal, including US manufacturer TeleVideo's Personal Terminal.

The main demand is from process control organisations, explains Mellor, such as large chemical companies, power station control and military command and control systems. Other interesting growth areas are public access systems, information retrieval systems and training.

Mellor says that several large

orders are in the pipeline from training colleges: "Students can interact with a touch terminal more easily than by using a keyboard."

Touch terminals are also good for multiple simulation systems, for example, control panel training, where the user can put up different simulated control panels on the screen at the flick of a switch.

"We've been preaching the touch screen gospel for some time now," says Mellor, "and now we feel that it is bearing fruit."

idem
The rest are just copies

WIGGINS
TEAPE

by Andrew Thomas and
Philippe Van Parijs

develop along two separate paths as Prime and Cambridge, the product's developer, add enhancements. Prime plans to integrate Medusa into its own complete CAD/CAM system, and is now looking for up to 14 people "very urgently" says a company spokeswoman.

The 14 will fill vacancies left at Stevenage by last year's redundancies and resignations.

Medusa runs mainly on Prime kit, but according to Cambridge chairman John Chilvers, a DEC Vax version has been around for three years and until now has been kept under wraps on his orders.

"We weren't hiding it, we just weren't pushing it at all," says Chilvers. "But now we've got worldwide rights, there will be a change of emphasis."

After June 1, Medusa is likely to

The version of the package bought by Prime, version 4.6, is the current issue, but the US mini-maker will not get any of the

1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 26



TWO parallel schemes to build

Both involve GEC, ICL and Ferranti and the longer-term scheme will also incorporate Thorn-EMI, Plessey and STC.

The longer-term idea is to develop a common architecture for all UK manufacturers of computers and their components. This is likely to take at least three years to accomplish and will probably involve many more firms than the present consortium of six.

Alvey director David Thomas, who is responsible for the intelligent knowledge-based systems aspect of the five-year programme, is about to announce another major plan involving a consortium of big firms in image processing. And another initiative in VLSI is close

to launch.

by John Kavanagh

pects: we're talking to software firms and to merchant bankers that can find good companies for us."

Last year the US operation increased its business by four times to \$1 million and broke even. There are 20 staff.

"It's a nice little base, but if we are to break into the market it must be much bigger," says Swinstead.

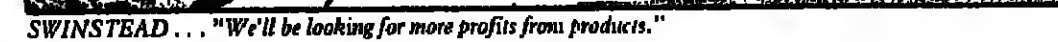
Systema Designers' main business has always been building customised systems. Government contracts, especially defence orders, account for 45% of its business. Swinstead says many elements from these contracts can be packaged as standard software products.

"Over the next three to five years we'll be looking for more profits from products," says chairman, Philip Swinstead, who formed the company in 1969. "The US is the biggest products market, so it's most important for us to get in there. We're looking very seriously at acquisition pro-

Systema Designers' main business has always been building customised systems. Government contracts, especially defence orders, account for 45% of its business. Swinstead says many elements from these contracts can be packaged as standard software products.

It has built secure office automation networks for government users. Swinstead says 1985 will see the launch of a standard secure network product by the company.

"We will still supply big



by Nuala Mnzran

this might happen and that the government would make sure Mercury got some contracts. Talbot appeared very satisfied with his sources when he made the speech and the POEU is now trying to find out exactly what the position is.

Meanwhile cable laying for Mercury's figure of eight optical fibre network is "going like a bomb", says Skinner. The cable is being laid in troughs along railway lines.

The threat of work on the network being blacked by the National Union of Railwaymen came to nothing earlier this month when its executive sent a memo to members saying it had decided to co-operate on the network.

Mercury has established one communication link - a microwave link between London and Birmingham.

by Jack Gee



STERN . . . Can be confident.
The title *Thomson Telescope*

the weight of management and technology in the new comparison comes from CIT-Alcatel, an offshoot of Compagnie Générale d'Electricité, one of the few nationalised firms in France showing a profit.

French President François Mitterrand will be keeping a partic

The companies' chairmen, appointed two years ago after the 1974 election, were nationalised

companies were nationalised, to be judged at the beginning of 1985. Those who have shown signs of turning round failing groups, such as Bull's Jacques Stern - can be confident of holding on to their jobs. Others, like Thomaso Alain Gomez, who still have signs of ground to make up, might be discarded.

by Keith Holder

In this mode it is not completely IBM-compatible, because the computer's flat screen cannot handle some of the graphics.

The screen can display 16 lines of 80 characters, four times as much as the Tandy Model 100, which is about the same size. Software compatibility is said to include the ability to run Microsoft's flight simulator.

The machine was developed by Mitai in the US, and Kazuhiko Nishi, from Microsoft.

A spokesman for Kaypro says that the preliminary agreement with Mitai will be made permanent next month, and will result in Kaypro having an exclusive license to sell the machine.

No price has been agreed yet.

by Donald Kennett rose from 66,300 to 70,783.

Ericsson Information Systems, the office systems part of the Ericsson group, plans to add 100 new staff to its UK complement of 230 this year.

UK managing director John Bunce says the company has grown at an average of 51% a year since it was set up in 1981, and more staff are needed for sales and customer support to sustain and

Last year's sales reached £17.4 million and the main growth areas were electronic typewriters and Altekop video workstations. But the company introduced several new products to the UK last year, in-

This year it plans to launch its Eripass access control system, a range of modems and a range of

Bunce adds that a major factor in his company's progress is the merger with Facit, whose office furniture has enabled the company to supply "absolutely everything" to offices, warehouses and factory management systems.

1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 26

Sinclair seals Korean deal

by Nuala Moran
SINCLAIR Research is expanding its markets in the Far East by way of a deal with Samsung Electronics of South Korea. The deal licenses Samsung for local assembly and distribution.

The deal covers the ZX81 and Spectrum. Sinclair will ship out the components and it is expected that the first machines will be on sale in South Korea later this year.

A Sinclair spokesman says: "There is no published or quotable figure on what this deal is worth. But we are confident that there is significant potential, and obviously Samsung is a company with a great deal of strength, so it has all its distribution worked out."

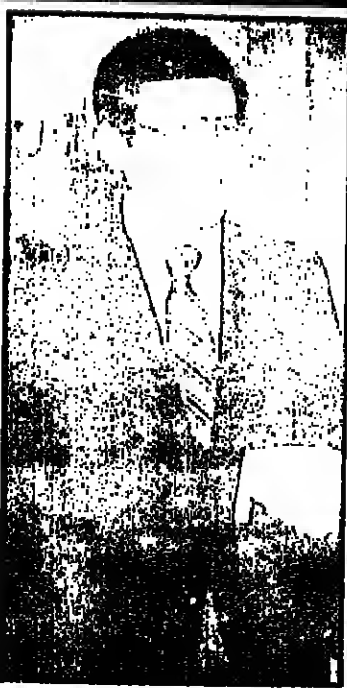
"This sort of local assembly deal is the only way to get into this market," he adds. This is because of high import duties on finished goods.

There are no plans on the software front. "Software was not a subject addressed in any detail in this deal," says the spokesman.

He confirms that there is no possibility of Samsung assembling and selling the Quantum Leap (QL).

The deal involves only the South Korean market, and there are no plans for Samsung to sell anywhere else. The deal will not affect Sinclair's Chinese venture, which in any case is hardly off the ground.

The company made an agreement last September with the



CHUNG... Signs with Sinclair.

South China Computer Company and the China Electronics Import and Export Corporation to do trial assembly of the ZX81 and Spectrum with a view to assembling and marketing the machines in China.

The Sinclair spokesman says: "They didn't get the first product for trial assembly until the end of December and so they haven't completed their evaluation yet. We're waiting to hear from them what their level of interest is."

Earlier this month, Sinclair announced plans to "drastically enhance" its sales outside the UK and US, including the licensing of companies in South America, Africa and Asia to build its products, and developing the French and German markets.

Samsung Electronics manufactures consumer and industrial electronics. It had an export turnover of US \$500 in 1983.

NEC attacks OEM disc market

by Keith Holder
FLOPPY and Winchester drives from Japanese manufacturer NEC will hit the OEM market this month.

Nike Jeffrey, disc product manager for NEC's European business systems division, says that the move is designed to secure a large slice of the non-captive OEM demand for disc products. He estimates that the growth in demand for 5 1/4-inch Winchester discs alone is around 60% per year.

NEC's initial introductions will be 5 1/4 inch and eight inch Winchester, plus eight inch floppy discs with maximum capacities of 20, 167 and 1.6 Mbytes.

A European distribution network is being set up and Thame Systems has already signed up to supply eight inch Winchester.

From April, samples of a slim-line 5 1/4 inch floppy disc and a nine inch, 320 Mbyte Winchester disc will be available.

Jeffrey says that two of the discs fit into a standard 19-inch rack, offering a compact unit with over one gigabyte of storage. Later in the year the company plans to introduce a 3 1/2 inch floppy disc.

Jeffrey says that the discs will be marketed in earnest from April, but adds: "We are not going to flood the European market."

He says that he expects a slow growth initially, but hopes to build up support with a solid user base.

There are no plans to introduce the company's optical disc system before the end of this year, he adds, and it is unlikely that NEC will set up any manufacturing facilities in Europe for the time being.



DUGGAN... "Purely commercial decision."

Receiver tries to save Altergo

by George Black
ALTERGO Ireland has been put into the hands of the receivers, who face the difficult task of reviving its major contract with the United Arab Shipping Company.

Cord Investment, which held 80% of shares in the company, has appointed William Horgan of accountancy firm Arthur Andersen as receiver to sort out its financial affairs. Cord managing director Niall Duggan says that it has lost over £100,000 and has decided not to invest any more in Altergo.

Less than a year ago Cord took a 60% stake in the Dublin subsidiary of Altergo when the parent company went into liquidation. Since then, it has increased its share to 80%, the rest of the stock remaining with other former Altergo shareholders.

Horgan says it is too early to say what can be rescued from the situation as his staff is still gathering information. He hopes to have

assessed the picture by the end of this week.

United Arab Shipping Company will not comment on the collapse of its £1.4 million contract to supply a new system, saying the matter was in the hands of lawyers.

It is extremely doubtful whether the job can be finished now that the 65 Dublin staff involved have been laid off.

Duggan claims that the original contract with the Shipping Company had been re-negotiated when Cord took over Altergo Ireland and the completion date of summer 1984 had been taken out.

He says this means that the Shipping Company cannot claim for damages. He adds that it is obliged by the contract to supply staff for testing the new system at certain times, which he alleges has not happened.

Because the testing has not been done, the Shipping Company has fallen behind with its monthly

payments to Cord, Duggan says it has been unable to complete the work unless it raised more capital.

"It didn't even try to do this, it was a purely commercial decision," he says. But he believes that if the money had been there the system could have been finished in August.

One ex-employee, however, who would not be named, says: "When the redundancies were announced there was nearly a riot because people felt the operation had been so badly mismanaged. It had some problems before the takeover, but it has been 10 times worse since."

Duggan met the Kuwaiti managers in November to alter the timetable, but it slipped again. Altergo's other big scheme, for Saudia airline, is going smoothly and will be finished by June, according to Duggan. But the 20 people on the project will need to be re-allocated somewhere.

Fujitsu discs venture out of Japan into US

by Keith Holder
JAPANESE electronics giant Fujitsu has announced that it will start producing its high capacity memory disc in the US. This will be the first time the company has produced discs outside Japan.

A spokesman says that the move would "strengthen the company's overseas strategy", but admits that it is also a way around discrimination by US companies of foreign products.

He says that the company hopes to start production this year, but no formal timetable exists yet.

The plant in Santa Clara, California, will be on the same site that

Fujitsu manufactures business systems components.

The plant will also be ideally sited for one of its biggest customers, Amdahl, which uses Fujitsu disc systems in its own product range.

A spokesman for Amdahl says that there have been no discussions with its Japanese partner on this point, but he did not rule out the possibility that discs from the new plant would be used.

Silicon Express is to be the first UK distributor for Fujitsu's 5 1/4 inch Winchester disc drives. Units are already in stock and will be supported by the company.

Directronics sets up Australian viewdata

by Donald Kennett
DIRECTRONICS Australia has bought \$2.5 million worth of Sperry 1100 series mainframes and DCPs (distributed communications processors) to set up the country's first nationwide public viewdata service.

The service will be based on the UK's Prestel standards and will be upgraded to support the GBT European standard later.

This week's Computing Centre teamed up with Langton Information Systems and Telecom Australia to present a series of seminars in Melbourne and Sydney on Prestel's public and private facilities, with case studies of viewdata in finance, industry, government and leisure.

The first machine for Directronics' service is due to be installed in Perth, Western Australia, in May, and others are to go to Melbourne, Sydney, Adelaide and Brisbane during this year. The company has also negotiated to take information from overseas viewdata systems.

Directronics has run successful trials for its service using public viewdata kiosks in shopping centres to supply sponsored retailing information, news and weather reports.

NEWS ANALYSIS

Recruitment and training are vital issues that refuse to be solved easily. George Black reports on a House of Lords inquiry into recruitment and Philip Hunter examines the limited success of a government training scheme

Fight the modern fight, Do TI told

The House of Lords Select Committee on Science and Technology is inquiring into recruitment problems through a series of public hearings. Last week it interviewed Sir Ieuan Maddock and the past principal of Manchester Polytechnic Sir Alex Smith. At a previous meeting it took evidence from Alvey Programme director Brian Oakley. George Black reports.

A NUMBER of higher education establishments should be nominated as national institutes of industrial technology and be funded through the Department of Trade and Industry instead of the Department of Education.

This is the main recommendation of a written paper presented to the Lords inquiry into new technologies by Sir Ieuan Maddock. Maddock, former government chief scientist, is now deputy chairman, International, of the US General Electric.

He proposes that the level of funding should be deliberately made more attractive both in terms of student grants and in support for equipment and postgraduate studies at these centres. They should be allocated a higher proportion of visiting professors, lecturers and other facilities from the best reaches of industry.

Strong emphasis should be put on marketing and international trade methods, opportunities and constraints.

The level of funding provided by the Department of Education and Science should not only be reduced correspondingly, but by an even greater proportion. In its place should be direct funding by industry at both secondary and tertiary level.

Explaining his recommendations, Maddock told the inquiry that he had begun from the

premise that Britain depended upon manufacturing industry and this in turn depended upon the quality of people.

From now on, we will depend far more on human intellect to add value than on our natural resources such as oil or coal, he said.

"You could run Monaco on tertiary industries such as services, but not the UK," he commented. "Either we make the great leap forward, or we become a country dependent on hand-knitted Fair Isle sweaters. As you cannot do that with a country of more than five million population, we don't have any choice."

Japan, Taiwan and South Korea have all set themselves the same goal. Britain should now mobilise its labour force for the coming war for electronics markets, as it did in 1939 for the Second World War.

One third of Taiwanese schoolchildren, a terrifying figure, are now coming out qualified in electronics, he said.

"We are fighting a dire economic war, but I think we can do it."

Industry should be encouraged — coerced even — into providing money through powerful tax inducements. Where public money is used, it should be committed to educating the high quality staff industry needed.

It is ridiculous, according to Maddock, to witness giants of the electronics industry whose business is largely with government, bemoaning the fact that they are starved of technical personnel.

The number of mid-career specialist training or re-orientation courses should be boosted, following the example of Cranfield Institute of Technology. Again, there should be powerful inducements to industry to detach its rising stars from their workbenches, machines and offices for further

training. Civil industry has much to learn from the armed forces in this respect, he goes on.

Maddock hopes that with the authority of the House of Lords a dramatic attack could be made on this vital question.

The inquiry had already heard from senior officials of the Departments of Education and Science, and Trade and Industry. It will also take evidence from the Manpower Services Commission and the Science and Engineering Research Council, among others. It is expected to publish its findings by August.

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PEARSON... Non-IT graduates find it hard.

"Those studying IT from a technical first degree have been most in demand by employers," says Richard Pearson, associate director of IMS. "Arts and social science students converting to IT have had more difficulty in finding employment but, even so, have been better placed on the job market than the non-IT graduates."

As well as conversion courses, the IT programme supports specialist courses for graduates in computer science, microelectronics or other IT-related subjects.



MADDOCK... "Ridiculous to witness industry giants bemoaning the shortage of technical personnel."

spend it better. We should shift it away from the elitism of science towards industrial technology."

It needs the University Grants Committee list of priorities to be turned upside down, he said. There would be much opposition, but this must be accepted.

Committee member Lord Swann voiced his concern about what Maddock was proposing.

"There is enormous inertia in university research and still more in university teaching," claimed Swann.

"The university system has given rise to a whole range of middle-class closed shops. We may be in danger of setting up a new establishment here. Shouldn't the initiative come from those firms that need the people?"

He suggested that firms should

be more ready to take people from other disciplines and re-train them, as biologists had been re-trained for radar work during the war.

Maddock agreed there had been a great outpouring of talent in the early part of the war, unlocked by the emergency. People were far more multi-disciplinary than they believed themselves, he said. The head of IBM's Hursley research laboratory was an Oxford classicist.

The problem was that, although money was going into research and development, the matter of staffing had been left entirely to evolution.

Sir Alex Smith, past principal of Manchester Polytechnic and past chairman of the Schools Council argued that industry ought to be

taught as a subject in schools. It was just as important in people's lives as literature or music. But he had failed to win CBI support for this view.

Swann said the most important thing of all was to get schools to understand why manufacturing industry mattered.

Lord Gregson, chairing the meeting, asked Sir Alex whether it was possible to make the great leap forward without adopting an elitist approach.

Sir Alex replied that it was no good having a splendid elite without support from underneath. West Germany had two-thirds of its non-graduate population with qualifications, while the UK had only one third. And Japan is training 11 times as many engineers as Britain.

Cash boost fails to draw fresh blood

THE government's £100 million Information Technology Initiative is having only limited success in bringing new blood into the computer industry to stem the skill shortage.

One of the chief aims of the three-year programme, which was announced by Sir Keith Joseph in December 1982, is to expand postgraduate conversion courses aimed at people with first degrees in subjects not related to information technology.

But students who completed these conversion courses at UK universities and polytechnics in the summer of 1983 have found it hard to find jobs in microelectronics and computing.

A report just published by the Institute of Manpower Studies* suggests that employers will only take on students who have taken an information technology conversion course as a last resort, and that employers prefer either people with several years' experience in the industry, or graduates in computing, microelectronics or other subjects directly related to their job.

"Those studying IT from a technical first degree have been most in demand by employers," says Richard Pearson, associate director of IMS. "Arts and social science students converting to IT have had more difficulty in finding employment but, even so, have been better placed on the job market than the non-IT graduates."

As well as conversion courses, the IT programme supports specialist courses for graduates in computer science, microelectronics or other IT-related subjects.

Students from these courses have been successful in finding work.

Most of the students from the conversion course have also found work now, but the difficulty they have had is that the government has expanded the total number of places available under the IT programme from 200 in 1982/1983 to 1,000 this year.

Many of the employers surveyed by the Institute welcomed initiatives that increased the number of people with IT skills, but said they would have few vacancies for conversion students.

However, some employers said that students with a first degree in an IT-related subject in addition to a specialist IT qualification were attractive propositions.

But many employers say that their demand is mainly either for good first degree graduates in electronics or computer science, or for people with several years' relevant experience.

Most employers as yet seem to doubt that the government's IT advanced courses, especially the conversion ones, will convert raw graduates into the experienced engineers and software specialists.

While present demand is greater for experienced people than for trainee graduates, training schemes like the government's Advanced IT programme are the only hope of reducing the skill shortage.

The survey also reveals that the IT programme has only had limited success in attracting arts and business graduates into the industry. Only 8% of the 105 students in the survey sample had an

arts degree, and business graduates only accounted for 13%.

The majority (about two thirds) had taken first degrees in a scientific or technology subject. Many of the courses for the 1983/1984 academic year are heavily over-

subscribed. Most applications came from male university graduates. Many women were effectively barred from some of the courses which were restricted to science and engineering graduates, who are predominantly male.

But one of the subsidiary aims of the scheme is to encourage more women into the industry through the conversion courses.

* Manpower for Information Technology, IMS report No. 45. © University of Sussex, Falmer, Brighton BN1 9RF. Tel: (0273) 686751.

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CGS INSTITUTE

Canadians cut down Cobol slog

by Claire Gooding

A CANADIAN firm is presenting its "Intelligent Cobol" to the US Department of Defence in a bid to revive the Department's Stars programme for software reliability.

Ontario-based Netron claims that its Computer Aided Programming technique cuts out 90% of coding, and also claims the technique can supply most of the requirements which the Department specified in its long-term plan for Stars (Software Technology for Advanced Reliable Systems).

"Stars was scheduled to be completed by the year 2000," explains Netron's marketing manager Paul Patz. "We believe that we can supply most of what is required already. The Department has only specified in a very general way partly because of the cutbacks. We are going to put forward a proposal to complete the specification with the programming tool within a couple of years."

Netron, based in Ontario, has specialised in Wang-based systems for the last couple of years, and recently launched the tool as a way of producing code for IBM.

Cobol seems an unlikely vehicle for a project which was planned to end in the year 2000. But the product was built to use Cobol only because of the commercial importance of the language, and according to Patz, the concepts used could be adapted to another language such as Ada and any other target hardware.

"It uses machine and language-independent principles," says Patz. "It uses the concept of 'frames', developed in Massachusetts Institute of Technology. Basically, one reduces the tasks into the smallest possible elements and then builds a hierarchy."

"What we have done differently is to apply artificial intelligence and engineering principles to software production. It is half way between the fourth and fifth generation of software."

The top uses some "expert systems" principles to define which of its re-usable modules can be used in new applications, which need further specification, and which need totally new code to be generated. The specifications are kept separate from the source code, which is generated complete, but can be amended by hand.

Netron is working on a version of the programming aid which can be used to automate existing applications rather than being of use only in building new programs.

Over half of its 55 research and development staff are working on the product, which already earns Netron's bread and butter by generating tursky applications. This sells to software houses and other users for \$15,000 for a one-terminal system.

Sisk comes to preach Pick

by Claire Gooding

TOP independent Pick consultant Jonathan Sisk is coming to the UK to give courses on the increasingly popular multi-user operating system.

Until recently, the Pick world has been a closed one, and training on Pick has been supplied only by the hardware distributors such as Electronic Data Processing of Sheffield, Interactive Data Machines of Doncaster, the University College of London, and Aston Technology, whose courses are tied to sales of Pick-based systems.

Now Taurus Technology, the training subsidiary of the Span group, has recognised the swell of interest in Pick and is supplying the first hardware-independent course on the system.

Sisk will be taking the first one-week course and also a one-day "Management Overview" in London in early June, and will be running a similar course for Span in Australia.

Sisk is well-known among the Pick community as the author of the *Pick Pocket Guide*, a neat pamphlet-sized guide which gives a quick-reference for programmers and operators on all Pick verbs and commands.

He has worked Pick closely with Dick Pick, originator of the operating system, and Pick's company Pick Systems, and has long experience giving training courses for Pick licensees.

"Demand for independent

training has become noticeably higher in the last couple of years," says Sisk. "It used to be the case that the licensees wanted training only for their technical people, but now there's a definite interest in a general all-comers Pick course."

Sisk attributes the increase of Pick's sudden respectability and availability, now that long-standing low-suits have been cleared up, as well as Pick's arrival on powerful 58000-based 32-bit micros, which bring its price down.

According to Doug Woodward, managing director of the Span Group in the UK, the Pick course is complementary to the Level II company's Unix training, not a rival or indicating a change of loyalties.

Micro Focus launches compiler

by Claire Gooding

MICRO FOCUS has announced a high-performance version of its Level II Cobol compiler for users of IBM's Personal Computer. The HVP Level II Cobol is aimed at development programmers who need extra speed in running

The HVP implementation uses a native code generator especially tailored for the PC. It takes the intermediate code produced by Level II Cobol and translates it into machine code, which runs three to six times faster than intermediate code, and up to 15

times faster for some programs.

The new high-performance version supports the Animator and Forms-2 development tools. Its arrival on the scene means that the standard version of the Level II compiler will be re-named Compact Level II Cobol.



TALBOT... Alvey will evolve three generations of Ipses.

Alvey work is near

THE Alvey Directorate is poised to place the first section of its software engineering programme with ICL, GEC, York and Newcastle Universities, Systems Designers and the Microelectronics Applications Research Institute.

The job involves the software centrepiece, an Integrated Project Support Environment (Ips) to be built over four years. The work will cost £4½ million, two-thirds of which will come from government. The directors are expected to place the contracts through the Ministry of Defence's contracts branch.

The contents of the research came into sharper focus at a meeting of the British Computer Society in London last week. Alvey director David Talbot, outlining the thinking behind the national plan, said they would evolve three generations of Ipses.

The first, under the Unix operating system and file-based, would be tried out on industrial pundits to get their views. The second, not necessarily Unix-based, would use the results with a

clean-sheet approach aimed at achieving life-cycle coverage of program development, taking the distributed database approach.

The third would seek to incorporate what had been learned by them about intelligent knowledge-based systems.

He emphasised that although the directors had a small budget compared to many of their competitors, the research content of the Alvey Programme would be larger than that of most industrial R&D.

A broad strategy document is issued last December announced the goal as an information systems factory to be designed at a cost of £65 million by 1989.

John McDermid, of Systems Designers, told the BCS meeting that it was improbable that formal methods of specification would be introduced early in the life-cycle of software development.

Systems Designers has already been involved with Ips design with its recently-launched product Perspective. But McDermid admitted Perspective was only a first step.

CAP writes suite for Telecom

LONDON systems group CAP has won a £500,000 order from British Telecom and Securitor to write a management suite for their cellular radio venture Telecom's cellular radio (TSCR). The communications, administration and billing programs are to be written in Cobol and Assembler for the DEC Vax, and are due to go live next January. The software itself is worth £200,000.

Alvey teach-in

A TEACH-IN on artificial intelligence and its part in the Alvey Programme is to be held by the British Computer Society at University College, Torrington Place, London, on April 10, where guest speakers include John Taylor of the Admiralty and Bob Konowski of Imperial College.

Fortran strong

PATENT attorney Pal Atija, who claims to be the first to have patented software in the US, has published a book to guide others through the maze. *How to protect computer programs* contains advice on legal and technical ways of protecting systems. Atija's patented system only existed on paper. He used a unique algorithm to retrieve narrative information from a database. The program was designed to run on any machine and operating system.

Book on patents

FORTAN, the language of the 1960s is still around in force, as evidenced by the arrival of two 16-bit compilers on the micro market. Prospero, best known for its implementation of Pascal, has added the 16-bit Fortran compiler to its eight-bit Fortran. Topexpro of Cambridge has released a Fortran compiler, Fortran 77, to run on the CTL 9000 32-bit mini and the National Semiconductor 16032. Prospero's compiler is available for CPM, MS-DOS, and PC-DOS environments.

Students return

FOUR British computer students who took part in an international programming competition in the US came 21st out of 22 entrants. But the Thames Polytechnic team got a warm reception as the first non-American team ever to participate. The four students went to Philadelphia for the 13th annual contest held by the Association of Computing Machinery. The team consisted of Tim McNally, John Cavanagh, Duncan Macmillan and Robin Bate.

Informatics buys

SYSTEMS house Informatics is beefing up the applications side of its business with the acquisition of micro software house Cyma. Cyma, based in Mesa, Arizona, develops business software for micros for vertical markets such as law, accountancy, construction and medicine. Negotiations are to be finalised this month. Cyma's turnover is expected to be more than \$6 million in 1984 with a network of over 2,600 dealers in the US.

MSA window

MSA is to add a windowing system to its Peachlink micro-managing financial suite. In preparation at present and is expected to be launched around the end of April as an optional extra.

Unix expert

ONE of the world's foremost Unix experts, Brian Kernighan, is to speak at the next conference and exhibition run by the European Unix User Group. The EUUG is holding its conference at the University of Nijmegen, the Netherlands, April 16 to 18.

Unix expert

Portability, software configuration control and quality assurance are all neglected by procurers, he claims.

Unix expert

There are a lot of new people responsible for industrial computer procurement who are yet to have a disaster.

Software file is compiled by George Black

IBM plans to build Intel chips

by Keith Holder

IBM HAS clinched a deal with US chip manufacturer Intel to licence build the 8088 microprocessor which forms the heart of its top selling Personal Computer (PC).

This move, completed last Friday, means that IBM has succeeded in assuring its own supply of the chip, demand for which has been so great that Intel has been unable to satisfy orders and has been shipping part orders for some months.

IBM has also recently increased its stake in Intel from 17 to 18.8%. Aside from guaranteeing IBM a supply of the 8088, the agreement will allow it to ramp up production of the PC and control the cost of the chip for its internal use, a move which can only put its competition under more pressure.

Manufacturers already have an agreement with Intel which, in principle, allows it to manufacture the Z8000 microprocessor under licence. Whether Commodore plans to make use of this option is shrouded in secrecy, and neither company would comment.

But Commodore is expected to show a Z8000-based machine and an IBM-compatible prototype at next month's Hannover Fair, and has indicated in the past that it is planning to launch into the lucrative office systems market.

By making such an office machine IBM-compatible, it would be able to rely on the vast software library written for the IBM machine for both standard and specialised applications packages.

It is this factor that has led over 60 competitors to adopt the 8088 as the central processor which combined with the MS-DOS operating system, allows them to ride into the market on the back of IBM.

A spokesman for Intel says that the agreement will not effect Intel's revenue and it will continue as a major supplier to IBM. The speculation remains, however, about what IBM will do with its "bottomless well" of 8088 chips.

Industry analysts estimate that PC production will triple this year. IBM is not alone in trying to

secure a supply of this device. Commodore, which recently signed a technology agreement with Canadian firm Bytec-Com to use its technology as a basis for an IBM-compatible micro, is also reported to be having talks with Intel along the same lines.

Commodore is not saying anything, but such an agreement would eliminate the company's main argument for staying out of the IBM-compatible market — that it would have to rely on outside sources for microprocessor chips. Commodore has its own chip shop, MOS Technology, which supplies solely to Commodore and which designed the 6500 family processors used in present Commodore micros.

Commodore already has an agreement with Zilog which, in principle, allows it to manufacture the Z8000 microprocessor under licence. Whether Commodore plans to make use of this option is shrouded in secrecy, and neither company would comment.

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Link offers alternative to rigid solutions

by Keith Holder

A HIGH-SPEED data communications link tailored to the industrial control market is announced by Intel.

Called Bitbus, it is designed to make communications between distributed control modules, factory robots and process controllers available through a single system, which uses less cabling and has the flexibility to be modified easily.

UK technical systems manager Bob Critchlow says: "We are offering users an alternative to the rigid 'black box' solutions which have dominated this market."

Bitbus is based on the company's earlier Interconnect, Multibus, which Critchlow says is rapidly becoming an industry standard for communications buses.

As it is based on an established product there is already a large library of applications software to handle different communications protocols, he adds.

Bitbus is compatible with Multibus and can be used to connect devices on the factory floor to main computers for monitoring, Critchlow says.

He believes OEM designers of systems for industrial control will also find it easier to produce more flexible devices and implement changes to keep pace with new developments more quickly.

Intel has also launched two hardware and two software products to support Bitbus. Hardware comprises a single card controller for control modules, incorporating memory expansion sockets and digital input/output lines, and an expansion board to increase the number of single board drivers and memory chips.

System software, for multi-tasking and execution of control programs, and a software utilities package are available.

Shipments of the products are scheduled to start in the summer.

Festival of computing

THE Festival of Computing, from April 4-23, will offer something for Londoners in all walks of life, say the organisers.

It kicks off with a one-day Microelectronics and Information Technologies in Islington exhibition at Islington Town Hall, sponsored by ICL. Equipment from small home computers to larger

business systems will be on show. For those unsure of their need for micros the festival offers a general introduction to microcomputers seminars on how to select a microsystem, and an April 10 open house at the North London Computer Club, at the Polytechnic of North London.

More details on 01-734-2907.

NatSemi aims for Scottish world first

THE UK is well on the way to having a world first in semiconductor manufacture and will probably get it if National Semiconductor's £100 million worth of plans for its Greenock factory come off.

The company aims to be producing chips on six inch wafers in pre-production runs by December and to be geared up to full production runs three or four months later.

As far as announced intentions can give an indication this will mean that Greenock will have the first factory to get that size of wafer into mass production. It will, incidentally, be the largest semiconductor plant in Europe.

Terry Mills, MOS operations manager at Greenock for NatSemi, says: "It is not state-of-the-art technology but it is state-of-the-art manufacturing technology. We will be taking a pre-production process and for the first time making it a manufacturing process."

This will not be the first time that NatSemi's Greenock plant pulled off such a coup. It was the first in the world to solve the problems associated with the mass production of four inch bipolar wafers.

Six inch wafers give roughly twice as many usable chips as do the current industry standard four inch ones. A number of manufacturers are already producing six inch wafers, including IBM, Intel and Motorola, but none are doing it in production quantities as yet.

Motorola has been quietly assuring all and sundry that it will be introducing six inch fabrication to its East Kilbride factory.

NatSemi will be using its X MOS II process which it claims will give it feature sizes down to 1.5 microns — not far from the one micron limit that most people in the industry see as the practical limit for mass produced chips.

It is a dry chemical process as neither NatSemi nor anyone else has been able to use wet chemicals to achieve this degree of precision in etching circuits on wafers.

And it will feature wafer stepping, a process in which only part of the wafer is defined at a time as opposed to the standard four inch wafer technique of defining the whole wafer in a single operation.



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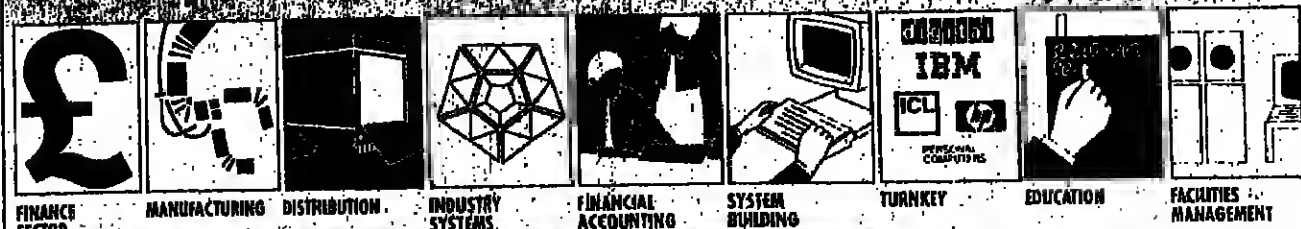
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Design expert warns of disasters

by John Riley and George Black

LARGB, real time systems buyers place too much emphasis on hardware requirements and fail to consider software design, says design consultant Ray Foulkes. As a result, disasters are inevitable, he warns.

Foulkes is chief engineer of the Scottish systems and software group of marine design consultants, Yard. The firm has played a key role in warship design and is now moving into the commercial sector.

"When buying micros, business users have had no awareness of the importance of software drilled home. But for some reason, that awareness isn't there when it comes to bespoke procurement for large systems," says Foulkes.

"There are a lot of new people responsible for industrial computer procurement who are yet to have a disaster."

Portability, software configuration control and quality assurance are all neglected by procurers, he claims.

Informatics buys

SYSTEMS house Informatics is beefing up the applications side of its business with the acquisition of micro software house Cyma. Cyma, based in Mesa, Arizona, develops business software for micros for vertical markets such as law, accountancy, construction and medicine. Negotiations are to be finalised this month. Cyma's turnover is expected to be more than \$6 million in 1984 with a network of over 2,600 dealers in the US.

MSA window

MSA is to add a windowing system to its Peachlink micro-managing financial suite. In preparation at present and is expected to be launched around the end of April as an optional extra.

Unix expert

ONE of the world's foremost Unix experts, Brian Kernighan, is to speak at the next conference and exhibition run by the European Unix User Group. The EUUG is holding its conference at the University of Nijmegen, the Netherlands, April 16 to 18.

Software file is compiled by George Black



■ Jane Smithard (above) has joined Micro Focus as "in-house" legal counsel and company secretary. A barrister, she will be responsible for all secretariat functions, and will play a prominent role in the company's contract negotiations. She spent several years with Control Data. Jeannette Lesmon has joined Micro Focus as personnel manager based in Newbury. For 15 years she worked for ICL.



■ Alpha Microsystems GB has appointed Laurie Bright as dealer manager. He joins the company from LSI.

■ Qudos Systems has appointed Iao Temple to be responsible for sales and marketing of the Rescue micro database product.

■ Prime Computer (UK) has appointed two support managers. Peter Towers is South regional support manager, with an area from North London via Oxford, and West in South Wales, while Paul Dean is support manager for the Scottish area. Towers has been with Prime for five years and was previously Northern district support manager for Prime's North and West District for a year. Dean has worked for Prime for four years in software support in Scotland.

■ Norwel Computer Services has recruited Karl Kaegler as sales director. He was previously sales manager with Automatic Information Management.

■ At a board meeting of Datastream Richard Stein, finance director of BOC, was appointed a director of the company. D. W. N. Pitts resigned as a director on February 16.



■ Langton, a computer and communication consultancy and system house has appointed Ferrol Danington as executive director; Jeffrey Steel has taken over as group manager in videotex and cable; Joan Gibson (left) has been appointed to similar responsibilities in office automation; and Ivan Newman (centre), has been appointed a business area manager. Newman, as a senior Burroughs man, twice won the annual Langton essay award. Other new consultants joining the Langton team include Alan Radlett (right) who will be in the telecommunications group.



■ Graham Coulson, previously a programmer with Computer Associates, has joined Maidenhead-based systems builders Micro Scope as an analyst/programmer. In his new position, he is currently project leader, responsible for systems development work on the Micro Space reservation and accounting system for tour operators, which is being developed for Panorama Holiday.

■ Modular Technology announces the promotion of Garry Garforth to UK sales manager, after six months as senior sales engineer. Previously, he spent three years as a sales executive with Coder UK (Motorola).

■ The Ryan-McFarland Corporation has appointed Barbara Finrose (below) as product support manager with responsibilities for marketing and customer support of the RM/Cobol product range in Europe. She previously spent several years with ITT, responsible for management information systems, and was later appointed software evaluator of ITT's Microcomputer Division.



■ Brixton-based computer manufacturer Jarogite has recruited a further three staff in systems design and sales. Paul Horwitz has been appointed systems design manager, and supporting him as systems designer is Iao Anderson. Sales manager Ivan Stillwell has five years' experience in running his own software consultancy.

■ Ericsson Information Systems has appointed Tony Stovons as national sales manager, Data Terminals Division. He was formerly Midland regional sales manager for Datapoint, and has more than 20 years' experience in data processing and information technology.

■ Yogie Trivedy has joined Turnkey & Applied Computing Systems as sales representative. Previously with British Olivetti, he has more than five years' experience of selling mini and microcomputer systems.

DIARY

MARCH 15
Image Processing Using Starlink. BCS Dundee. R. Stobbie, Royal Observatory, Edinburgh. Angus Hotel, Dundee, 7.15.

Communications in the High Street. BSC Guildford. Stuart Senior, Deloitte Haskins & Sells. Ballroom Annex, Stoke Hotel, Guildford, 7.00.

Today's Office is a Place; Tomorrow's will be a System. BCS West Herts. David Firnberg, BCS president. Aubrey Park Hotel, Redbourn, 8.00.

Introduction to CP/M. Course, Polytechnic of the South Bank, London. 9.30. £55 including refreshments. For further details phone 01-928 2790.

Visit to IBM Greenock, BCS Glasgow. Limited numbers. Contact J. C. Fleming on 041-886 4141.

CICS/VS Advance Design and Programming. Circle Education four-day course. London. £625. Further details from Brenda Harris on (0753) 889139.

CORE Workshop. Systems Designers Ltd five-day training course. Frimley Hall Hotel, Camberley, Surrey. £550 plus Vat. Further details from Keith Evans on (02514) 22161.

Fundamentals of Computer Operations. Compower two-day course. Training School, Canock, Staffs. £80 plus Vat and seminar. London. Free. Details phone (0272) 290651.

Programming for Database DLI. Compower four-day course. Training School, Canock, Staffs. £305 plus Vat and accommodation. For further details phone Canock 2511.

VM/CMS for Programmers. Altergo Education four-day course. London. £450. For further details phone 01-486 7288.

VSE Job Control for Programmers. Altergo Education two-day course. £290. For further details phone 01-486 7288.

Computers in Accounting: Developing Leadership Skills. MSS two-day course. Worthing. Inventory Management Control. MSS three-day course. Worthing. Project Management and Control in DP. Basic Fortran Programming. MSS four-day course. Worthing. For further details phone (0903) 347556.

Network Design. Frost and Sullivan 2½-day seminar. Park Lane Hotel, London. £425 plus Vat. Further details from Carolyn Budd on 01-486 00345.

Cobol for Non-Programming Staff. BIS Applied Systems three-day course. London. £35 plus

Vat. Further details from Cherry Bignmore on 01-261 9237.

Working with Computers in Business. BIS Applied Systems five-day course. Queens Hotel, Eastbourne. £630 plus Vat. Further details from Cherry Bignmore on 01-261 9237.

Practical Systems Design. BIS Applied Systems five-day workshop. Bedford Hotel, Brighton. £630 plus Vat. Details from Cherry Bignmore on 01-261 9237.

MARCH 20
Voice Input/Output. BCS West Works. Brian Pay, NPL, George Hotel, Huddersfield, 6 for 6.30.

Manufacturing Management. SIA Computer Services two-day workshop. Details: 01-730 4544.

Teleprocessing VTAM/SNA Concepts. Compower training course. Training School, Canock, Staffs. £70. For further details phone Canock 2511.

Conducting Feasibility Studies. BIS Applied Systems three-day course. Park Court Hotel, London. £345 plus Vat. Further details from Cherry Bignmore on 01-261 9237.

Introduction to Structured System Development Methodology/70. AGS Management Systems seminar. London. Free. For further details phone (0272) 290651.

Office Automation. Two-day seminar (also March 22/23). Information and Word Processing Association. Royal Lancaster Hotel, London. £235 plus Vat (non-members). For further details phone 01-242 8697.

Reducing Energy Costs with Computer Simulation. Control Data Energy Technology seminar. Bangor. Free. For further details phone 01-240 3400, ext 3305.

Data Analysis. Intelligence Engineering three-day course. Details phone (0633) 49622.

VS AFL Fundamentals. Coding and Drury three-day course. 16, Berkeley Street, London W1. £300 plus Vat. For further details phone Alice Angle on 01-493 6171.

Visit to Computerworld (UK). Readingstock. BCS Display Group. Contact R. A. Barnshaw on (0332) 43175, ext 7462/6109.

Visit to North Tysside Information Technology Centre. BCS Newcastle-upon-Tyne. Contact Ian Rees on North Shields 575029.

The BBC Micro. BCS North Staffs Joint meeting with the BBC. Speaker from Acorn. Physics Lecture Theatre, University of Keele. 7.30 for 8.00.

PEOPLE



■ Three former BDP employees have formed an independent software house specialising in the Pick operating system. The company, Oxy Software, was founded by John Moore (left), previously software product manager at BDP; John Scholey (centre), who was with BDP for 14 years and an associate director and chief programmer; and Alan Watt (right) who has worked in the computer industry since 1971.



■ IMI Computing has appointed Ray Davies as marketing manager, with responsibility for the promotion of all the company's products and services in the IBM marketplace. Davies' data processing career spans 15 years, and in the last year, he has been promoting IMI Computing's specialist IBM 8100 services.

■ Stephen Robinson has joined Drive Computing as an account manager. He was previously with Olivetti where he worked for 14 years.

■ Phillip Crawford joins MSA's Manufacturing Support Division with a year's experience within MSA already. He was previously account manager at MSA Inc, responsible for post sales support of manufacturing accounts in the Southern region, together with pre-sales system accounting. Crawford has spent the past five years in the US.

■ Peter Deaton and Lawrence Jones, previously with Vector General's former UK distributors R. and H. Systems, have joined Vector General as systems engineers, responsible for customer support and maintenance. John Harris, formerly with Software Sciences, also joins Vector General as systems engineer. Another new appointment is that of Mandy Lowe, formerly secretary to the managing director of Fire Engineering Associates, who becomes Vector General office manager.

■ Ferranti Computer Systems, Cheshire Heath Division, has appointed a new sales executive, Paul Froback, for its Fire and Security Systems Group. He joins from Carriers, Thomas, Ashworth and Co, where he was export sales manager.

■ Microvitec has appointed Alan Bland as national accounts sales manager. He was previously with Mattel Electronics as regional sales manager for Aquarius Computers and Intellivision.

CONFERENCES

■ THE Association of Simula Users, with the support of the University of Newcastle-upon-Tyne and the Centre for Software Reliability, is arranging a two-day seminar on computing system reliability at Newcastle University on March 27. The papers, to be presented by a set of prominent workers in this field, will address system structure, fault tolerance, programming languages, distributed systems, parallel programs, quality engineering and reliability measurement. Non-ASU members are welcome. Further information from Ron Kerr, Computing Laboratory, Newcastle University. Tel: (0632) 329233.

■ FROM March 26-30 the University of Manchester Computer Graphics Unit will repeat its successful course on interactive computer graphics. The course is updated regularly to cover recent developments, and topics to be discussed include types and uses of graphics equipment, graphics programming with GKS, algorithms for vector and raster devices, drawing curves and surfaces, machine interface design and software, colour theory, 3-D graphics including generation of shaded raster images, and a review of graphics packages. The fee is £150. Further details from Irene Delaney on 061-273 7121, ext 5619.

■ A COURSE on Cambridge Rings will be held at the University of Kent from April 2-4 under the auspices of the Joint Network Team of the Computing Board and Research Councils and is primarily for the benefit of

polytechnics and research council sites. However, there will be a number of places reserved for others. Further details from Mrs S. Woodward on 0227 66822.

■ A SERIES of seminars covering three days are to be presented, by the NCC, in conjunction with Software Engineering and Computer Weekly at the Software '84 Show. The seminars will be held at the London Tara Hotel from June 5-7. The subjects will include 16-bit operating systems, local area networking, mainframe operating systems, choosing the right database management system, viewdata, micro-based expert systems and others. For further information and/or reservations please contact seminar administrator, NCC, Manchester. Tel: 061-228 6333.

■ A THREE-DAY seminar to be held by Frost and Sullivan at Kensington Palace Hotel, London, from March 26-28, will examine source data entry across a wide range of applications, illustrate the benefits of capturing data at source and examine with examples the many different systems becoming available. An important part of the programme focuses upon the process of designing, selecting, field testing cost justification and installing a source data entry system. Also discussed in depth will be the design of a suitable training programme, the need to keep the customer fully informed. The seminar is designed for managers and staff at all levels. Details from Carolyn Budd, 00 01-486 00345.

■ Two management appointments have been announced by BIS Software to co-ordinate the development and launch of new systems. As planning manager, Don Unghart, will be responsible for the company's technical and market research and for planning new products. He has been with BIS for nine years, before which he worked for ICL and Sperry Univac. John Wills becomes product marketing manager for BIS Software. He spent 15 years in banking before joining BIS in 1977. He was formerly general manager of BIS' Luxembourg offices.

■ Apple Computer (UK) announces the appointment of Roy Stringer as the product manager for the Apple III. He previously worked as a systems consultant at New Micro Computers of Warrington, specialising in Apple II and Apple III-based systems.

■ Andrew Duncan has been appointed Software Consultant by Automatic Test Engineering. He joins ATE from Hewlett Packard where he was a senior systems engineer involved in the training of personnel in the use of the 3060 ATE system.

■ Dave Hazen-Smith has joined Rediffusion Computers as a salesman for the Manchester branch. Previously he worked for Vivon Computer Systems as sales and marketing manager.



■ John Cottrell (left), managing director of STC Telecommunications International, have been appointed to the main board of Standard Telephones and Cables. Cottrell became managing director, STC Telecommunications International in February, 1983 and took up his present position last July. He is also a director of two other STC companies: Standard Telecommunication Laboratories and IAL. Uteron became chairman of IAL and managing director, STC Communications International in 1983.

■ ISG Data Sales has recruited two new area sales managers to promote its services and equipment in the East and South. David Hopkins began his career in 1959 working on the service side for Singers before moving into sales, where he has represented Triumph Adler and Delta Data. He will be promoting ISG's new range of Avatar terminal converters in the East. Vic Amato joins ISG from Oceanic's Graphics, Micros, and Peripherals (GMP) sales department.

■ Felix Learning Systems has appointed Alistair Hardie as managing director. The company has already produced and published 18 interactive video programs which are available to business, industry and the public sector. Hardie was formerly general manager.

■ Paradyne has appointed Roger Archer as sales director, European distributors, with responsibility for sales through all European distributors including Israel and Turkey. He has held senior positions with Prime and ICL.

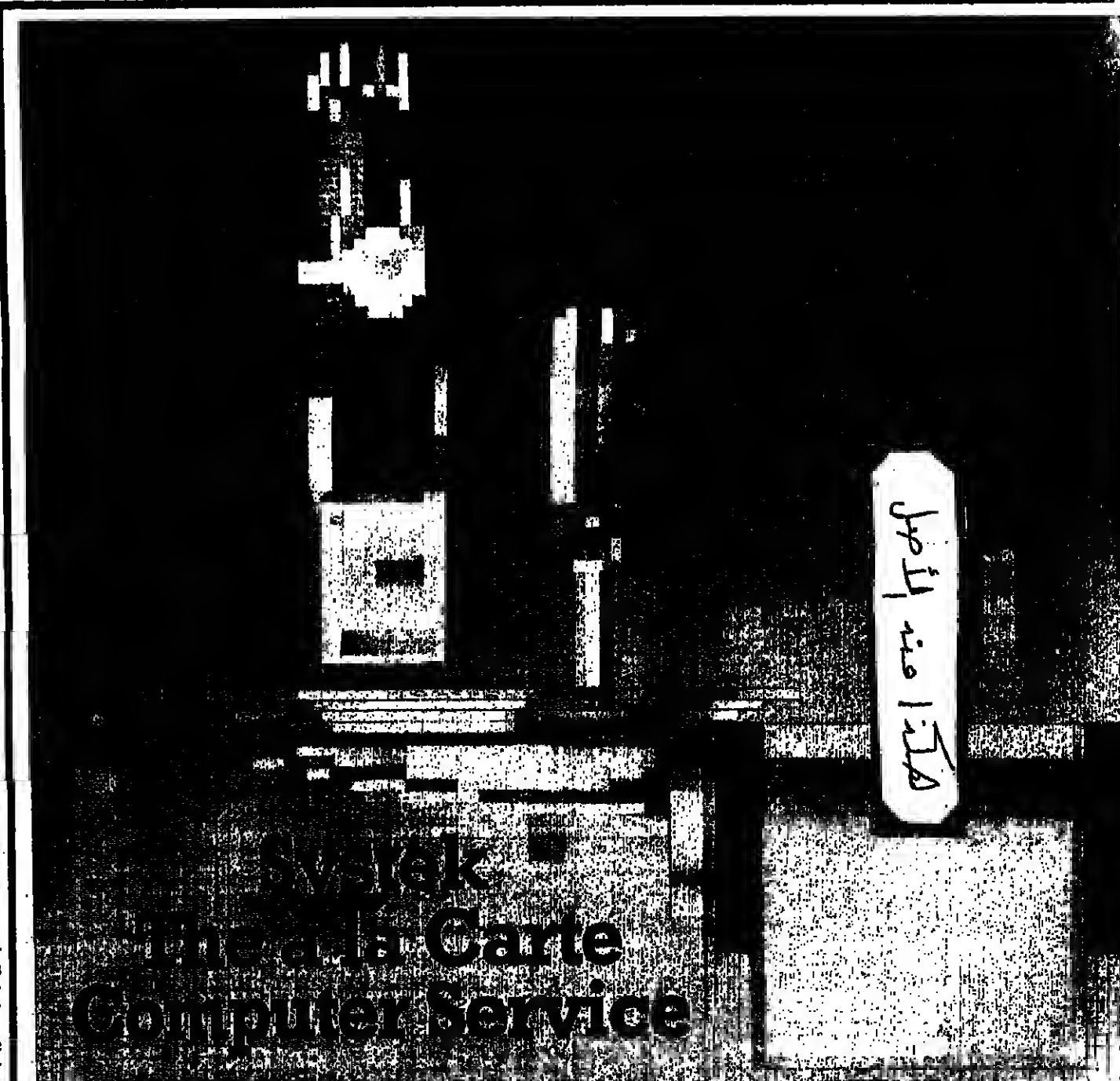
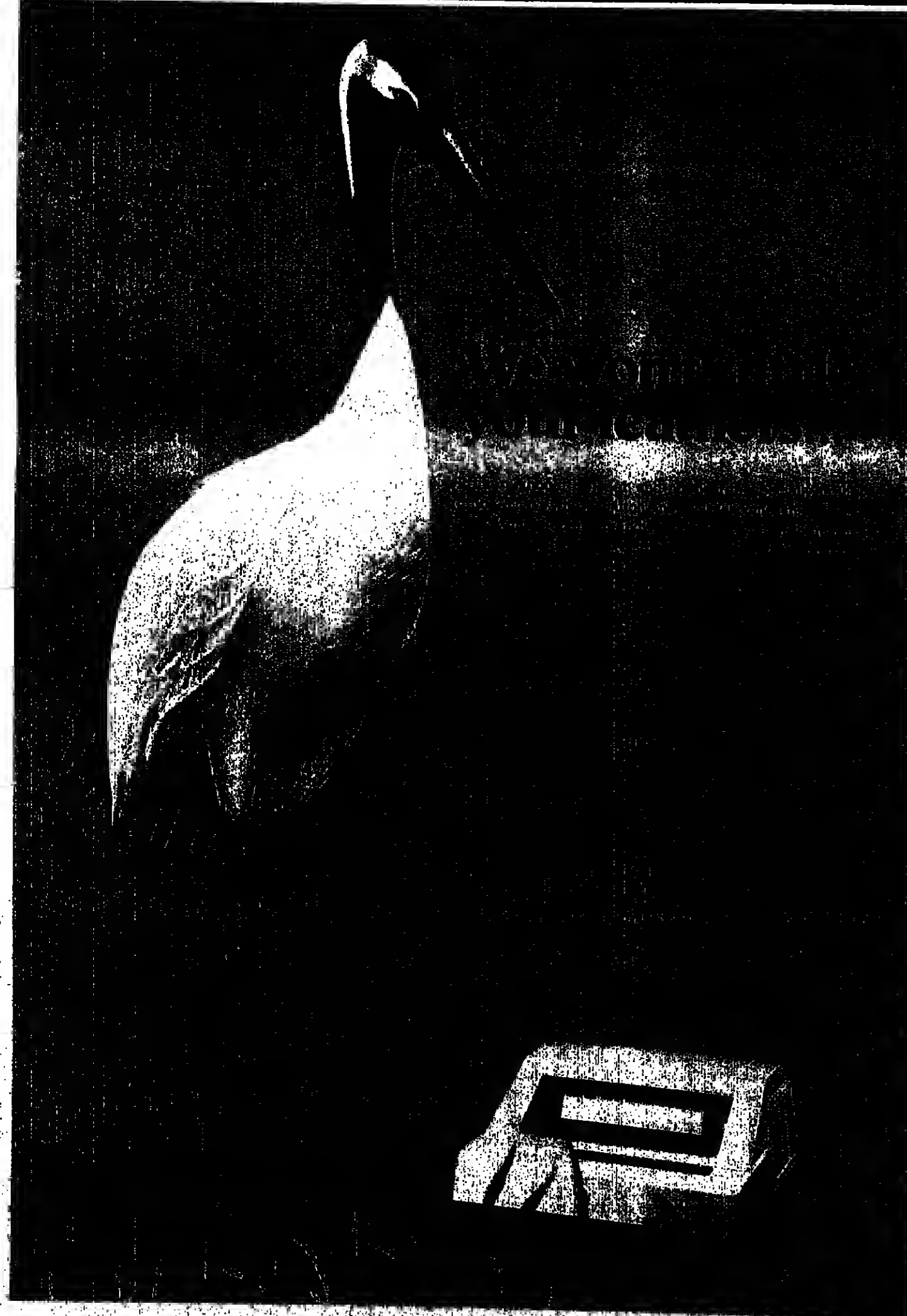
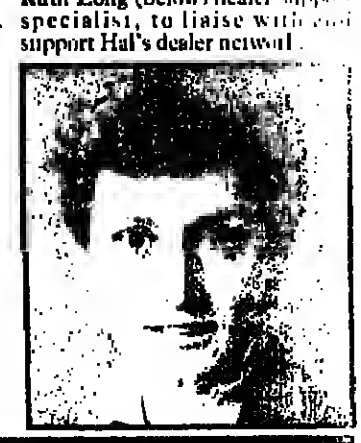


■ Martin Cutler, computer development manager in the Management Services Division of W. H. Smith based at Greenbridge, Swindon, is appointed technical services manager there. He succeeds David Gayler, who has taken up a new post with W. H. Smith Cable Services.

■ Hal Computers has appointed Ruth Long (below) dealer support specialist, to liaise with and support Hal's dealer network.



■ Terry Cartwright is appointed group director of marketing for Prism Technology (Holdings), the recently announced parent company controlling Prism's high technology distribution and development operations and ECU Publications. Cartwright joined ECU four and a half years ago as marketing director and became managing director two years later.



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Technology has evolved...

... but will the new fifth generation, based on micros, be revolutionary? Gordon Bell's lecture explored the theme

GORDON BELL, once head of engineering at Digital Equipment, and now chief technical officer at start-up company Encore Computer, yesterday (Wednesday) gave the Second Annual British Computer Society Jubilee Lecture, sponsored by Computer Weekly.

Bell was responsible for DEC's PDP-4, -5, and -6 minicomputers, and also worked on the PDP-11. He is a widely-published author on computer architecture and design and holds several patents in the computer and logical design areas.

Repeated below is some of the material used by Bell in his lecture at the Royal Society in London.

Bell's lecture is entitled "Computer Evolution". The abstract for the speech is as follows: since the ENIAC, the early Manchester machines, and EDSAC, computer development has been evolutionary. Revolutionary circuit technology has provided new structures following the time-war path.

Can the now fifth generation, based on ultra-large scale integration, be any different, using either revolutionary concepts or more parallelism?

LIKE the minicomputer, hundreds of information processing products can be built using microprocessors and their associated semiconductor and electro-mechanical peripherals because

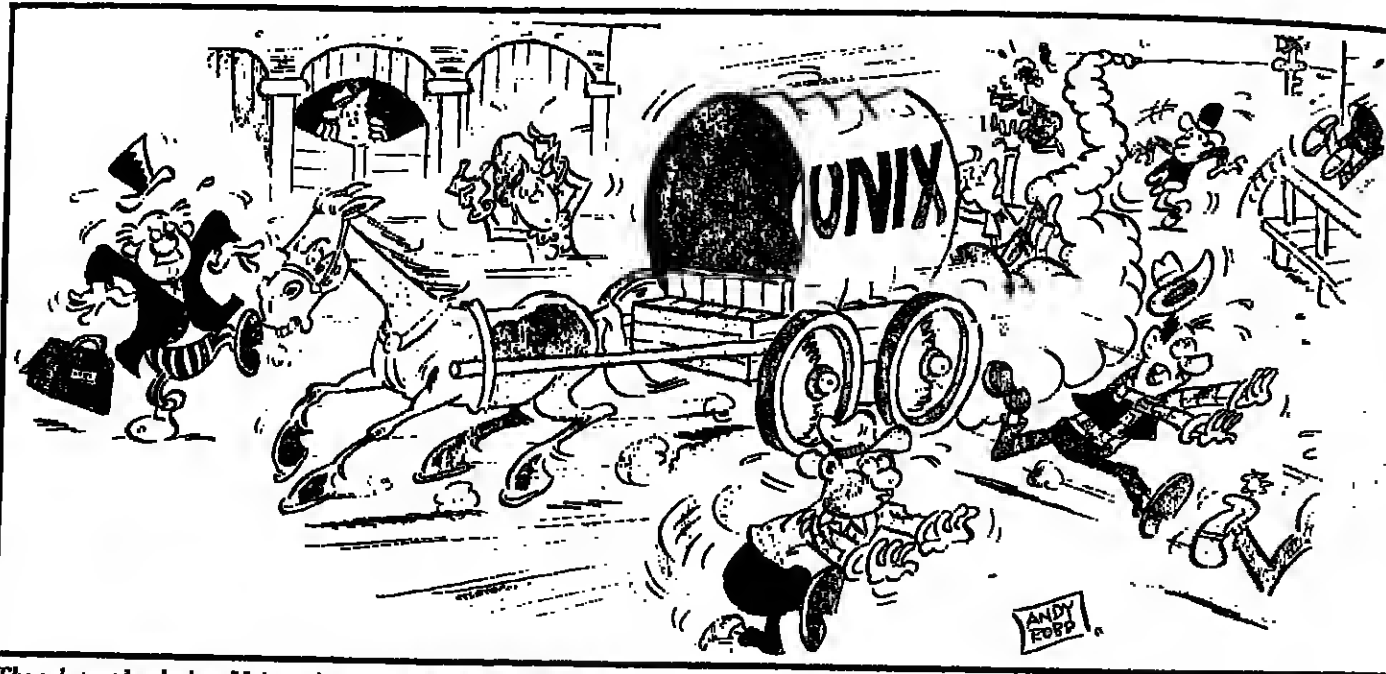
they are so inherently universal (ie programmable). In fact, many more products can be built than with the mini.

Let's totally ignore the products such as cars, instruments, testers, etc. that embed a computer in a larger product and whose primary function is not information processing.

When PABXs and telephones compute and store information, they too must be considered as part of the computer industry. That is, there can be substitution among personal computers, games, terminals, typewriters, computing telephones and so on when they perform the same function as general purpose computers.

The rapidly evolving high density semiconductor and magnetic recording products are clearly high technology, representing significant investment, high risk and high entry cost for a company. However, the systems assembled from these components are clearly not high tech, and the barriers for entering an end-user OEM or system level business with a generic product are negligible, especially when compared with previous computer generations which demanded a comparatively large number of disciplines.

A company can be formed by a part-time president, someone who can buy and assemble the various circuit boards into a Multibus backplane, a programmer to buy and load a version of Unix and one



The only people who love Unix are its parents and those who grew up with it.

or two helpers.

There are about 100 groups of one to a dozen or so engineers who are building workstations for various engineering and business professionals. Design consists of assembling the following:

- boards with microprocessors, disc, CRT and communication controllers that use one of several standard buses eg, Multibus, Obus, or VMEbus;
- appropriate discs and CRTs;
- standard or custom enclosures;
- a licensed version of Unix available from a myriad of suppliers;
- generic software including word processing, spreadsheet, etc.

Each new start-up company believes its product and business plan will best Apollo, one of the first entrants into the high performance workstation market. Just after going public, Apollo was valued at \$1 billion dollars in the fall of 1983; on annual sales of less than \$100 million with less than 1,000 employees.

In contrast, DEC has a valuation of about \$4 billion with sales of \$4 billion and a workforce of over 70,000.

A typical workstation start-up company compares itself with Apollo on two data points: its start-up date, which is usually one to two years after Apollo (when systems were easier to build), and the current month's annual shipments.

In this fashion, within two years each of 100 companies will be valued at \$1 billion, giving a valuation of workstation companies of \$10 billion to \$100 billion - at least one order of magnitude greater than any optimistic projection of the market.

This valuation does not include the established companies, such as IBM, whose values are approximately equal to sales and who may believe workstations are mainstream products.

Thus today's assembly operations that permit this great overstatement about hi tech are at the root of what is surely to be one of the largest corporate re-evaluations in the history of American business. The only barrier to entering the industry as a board, software or system supplier is having a personal computer capable of generating a business plan.

Formal standards by US and international standards groups establish many of the standards (constraints) for designers. These are typically low-level signalling, environment, communications links and languages.

De facto standards by various manufacturers provide the most important standards. These include microprocessor architectures, buses, peripherals,

operating systems and application software file formats.

The levels, and corresponding standards, for today's micro-based products are:

- hi tech semiconductor microprocessors (280 through to 8086 through to 68000 or National 32032) and memory chips (16K through to 64K through to 256K bits/chip);
- boards based on a standard bus (\$100 through to Multibus 1 through to Multibus II or Versabus/VME; IBM-PC cards);
- electromechanical discs (8in. floppy through to 5in. Winchester disc);
- hardware systems are particular to the structure, but usually use Multibus form factors;
- operating systems (Basic through to CP/M through to MS/DOS through to Unix);
- languages (Basic through to Pascal through to C);
- generic applications (eg, word processing, spreadsheet, etc);
- vertical applications within various professional and intellectual domains (eg, accounting, structured design, project scheduling).

Large vendors such as DEC and IBM treat computing as a substitutable commodity in a complete market place. Computing can be traded off among the personal, shared, departmental mini, mainframe levels over a price range of \$1,000 to \$1 million. (There is some evidence that growing use of personal computers increases the need for mainframes by giving more users access to tightly connected databases, instead of decreasing the need for mainframe power).

Computing carried out in any fashion should be treated as part of a single, available market.

Many alternatives are possible for supplying a range of products, from the purely general purpose base system, to the product that hardware is customised by the user and software.

The critical mass (or economy of scale) is in the hardware, sales, distribution, installation and service of hardware products. In addition to having very good products, winning requires both the OEM and end-user channels to get critical mass of product distribution and wipe out costs.

An OEM approach usually requires a product range, not just a point product. An OEM customer often requires service, and always requires high-level applications and field support assistance.

An end-user approach requires both a wide product range and complete sales/service.

The applications software company (eg CAD) that has to invent

its own hardware system is likely to become either obsolete with hardware, especially when reviewing what happened in the case of minis, or fall behind in its software development.

Furthermore, the company is limited by growth in its own market because investment is required in both vanity hardware and its



The barriers for entering an end-user OEM or system level business with a generic product are negligible

specialty added value software. The hardware vendors will surpass the combination supplier, and the software-only CAD companies are likely to provide better software.

Since the perceived (and often the actual) price of software is low, a company that has a software product and wishes to enhance its sales volume does so by buying hardware and then re-selling the hardware as a complete system. In effect, a company competes with the mainline manufacturer.

While the gross sales are up, the costs can easily outrun the sales since the company must support a hardware too. In addition, the software company doesn't usually market the range of products that a mainline hardware supplier has. Such a system is likely to be less profitable than a pure software supplier. In addition, the supplier is cut off from a large number of channels of distribution made possible when a basic software package is made to operate on many different base systems.

Look at the case of minis. The companies who came out on top did so by having fundamentally good general purpose hardware and then distributing it.

As a generic product for a variety of uses, in the case of minis, DEC opened up many markets with the PDP-11 as the range-included boards for embedded computing, a range of systems for personal computers, business,

communications, general purpose time-sharing; by facilitating the formation of a software industry to write both generic and vertical professional applications which the manufacturer integrated and distributed; through traditional OEM arrangements by encouraging others to embed a computer in other systems, as characterised by the early technical OEM marketing of DEC;

through other channels such as distributors, distributors to sub-distributors, retail outlets, insurers, etc.

Software product segments, ie, new professional software application products, will form from today's experts in existing coplanes which either have vanity hardware or OEM hardware because the true value of the product is completely contained in the software. Ultimately, these companies will disappear to be replaced by standard systems supplied by hardware vendors such as IBM; and software-only companies staffed by the experts who create the professional applications.

For a while, it looked as if a specialised market existed for the growing number of users who wanted Unix. Today, Unix promises to be the whole market, not a specialised market in itself.

Highly interactive computing with Unix is no longer a niche, but rather, the product constraint fund, or at least specify, IBM has shown its flexibility in adopting industry standards rather than forcing its own in a de facto fashion. If customers want it, IBM will likely supply it. IBM appears to be near announcement of Unix across the range from PCs to mainframes.

In a similar fashion, every minicomputer and microcomputer supplier will supply this standard in a similar way. While the combined market is large, the fundamental market has not been expanded, but merely made more accessible by every manufacturer. The result will be a much greater fall-out of the smallest manufacturers who have inadequate marketing and manufacturing organisations.

Unix evolved along these lines. Unix came from a reaction by Thompson and Ritchie to Multics, the large, joint MIT-Massachusetts Institute of Technology-Bell Labs project of the late 60s. It was written for a DEC mini and evolved to the PDP-11 in the early 70s.

DEC didn't give away operating systems to competitors, especially the source code; Unix was open.

Continued opposite



Virtually no organisation provides a full line of networked, compatible, multi-vendor products

From page 18

tionally free. Unix is by most measures a very simple operating system, so to do anything useful requires other programs such as database access, special communications, programming and so on. Students and faculty could understand all facets of its internals and use it. It was written in a high level assembly language, C, and as such could be modified. It was an excellent pedagogical tool.

Unix evolved to be used on other computers by being transportable. A team of people could carry it to another computer system, provided a C language compiler was available.

In fact, this created the notion that it might someday be possible to have a complete system that was machine and manufacturer independent. Users like this idea.

Chip makers and system builders who had no means of building software were able to get a system relatively cheaply. Thus, we have support and the beginning of a standard.

Much work is required to have a system that supports 80s computing concepts. In order to evolve

towards the generality demanded by the broad market, the extensions will include:

- Virtual memory. This function was worked out about five years ago and has been in operation for at least four years in the Vax version of Unix at Berkeley called 4.1.
- Special functions for real time and transaction processing. Unix is being extended to adapt in incompatible ways by diverse organisations.
- Human interfaces that are competitive with the PC. Unix grew up in a time-sharing world using dumb terminals. Windowing and fast interaction are critical.
- Multiprocessing. With the micro, many companies started to extend Unix for multiprocessing.
- Networks. Given the origin of Unix in communications, we should demand modern communications capabilities.
- Fully distributed processing across a LAN to form LANS.

The University of Newcastle, Berkeley and several companies have all implemented incompatible systems for fully-distributed processing.

The Unix phenomenon illustrates the power of standardisation, and we can learn from it. Like all operating systems, the only people who really love Unix are its parents and those who grew up with it. This is a large set. It also illustrates a recurring theme of standards: in order to make forward progress, one has to regress for a while.

Unix is almost a standard. There is not, however, a single version that is available in "bubble packs" that operates on a variety of systems. Each version requires the overhead of support, making the distribution again a matter of critical mass.

We have turned a large part of our future system development over to AT&T for one of the key interfaces by adopting Unix.

What will happen when all terminals built by the already shaken out terminal companies become personal computers?

Note failures at Atari, Mattel, Texas Instruments. Expect more losses (eg Computing Devices, Osborne) now the IBM Portable PC is here. Finally, there's a standard - The IBM-PC.

Mature; first shakens and mangers occurring. Will it be completely eroded by PCs, smart typewriters, smart telephones, workstations, etc? A general purpose structure that will prevail?

Varit over-subscribed with 100 68000-based Unix companies. Final will come with competition from evolving high performance IBM-compatible personal computers. Will next PC attack this too?

Basically a mini replacement at lower cost. A supermini replacement - but what about the mini-microputer suppliers?

A niche, but greatly over-subscribed by Tandem, current and emerging companies. An infinity of types?

Essentially zero cost micros deliver the best performance/cost. We expect gains through our ability to utilise these clusters through parallelism, which will mark the next generation.

Already over-subscribed. Can exist if the standards firm up.

A niche that add-ons to PCs will most likely fill.

An infinity of products and industries are possible based on the microprocessor and specialised hardware and software.

Microprocessor-based product classes:

Continued opposite

The fifth generation — can it add anything?

Unix must take this responsibility, commensurate with its selling of Unix as a standard operating system.

The notion of a standard is good. But it must be evolved more rapidly than any single, large manufacturer can. It can be evolved, provided there is parallelism in the development using multiple companies which is a complete Unix industry.

On the other hand, Unix is the single company doing and blessing all the extensions, we have simply substituted multiple competitive companies with one single behemoth!

The system has to be evolved in a reasonable fashion, not ad hoc.

Having Unix as a standard can let everyone enter the market on a commodity basis: yes and no. It's easy to develop the product, but how does one compete with the large organisations?

At the bottom time: Unix is the opiate that lets 100 companies form and assemble a product in a trivial fashion. The result will be far more brutal than in the case of minis, where at least some technical skills were required.

There are over 100 vendors in what is a commodity-like product valuing themselves at \$10 billion to

\$100 billion for a limited market to engineers, scientists and business analysts. All have the organisational overhead to start, but none have the critical mass to succeed, except those which are currently well established such as Apollo, Apple, Convergent Technology and Sun.

Finally, the 32-bit personal computers (circa 1984-85), led by IBM using 256 Kbit chips and the Intel 286, will provide the power of the emerging 68000-based Unix workstations at a fraction of the cost.

Basically, this structure competes with old line mini and mainframe-makers, both of which are becoming distributors for superminis, as in the Convergent Technology model.

Reliable computing like Tandem should no longer be treated as a niche, but rather something a user should be able to trade-off.

Because there is a somewhat different structure involved in building reliable computers, especially with respect to software, there is a possible niche market as evidenced by Tandem. As the overall reliability of computers increases, however, it is unlikely that anyone will pay even a 25% premium for

reliability let alone 100%.

There is still interest in making a self-diagnosing, self-repairing computer that never fails, however. While this is possible for the CPU and memory of a system, the software and peripherals do not permit this for some time.

With much lower priced machines, a broader range, and the introduction of full distributed computing in local area network (LAN) clusters, the need for high availability computers for incremental expansion will decline.

Several of the BUNCH have been relegated to decline through a declining base as all customers standardise on IBM compatible hardware. The microprocessor-based systems are a convenient product to market.

Companies in decline because of poor product competitiveness will witness rapid decline as high-performance, commodity-oriented, 32-bit microprocessors provide the same function as the traditional TTL-based mini, cheaply.

There are no barriers to entering what is decidedly not a high tech industry.

Economy of scale is most important in distribution and service.

Economy of scale of manufac-

turing may hold for a single product and single company such as for the personal computer and IBM, but not in general.

Time to market is far more important than economy of scale in engineering and manufacturing - which decidedly favours the entrepreneurial energy of start-ups who provide a single product.

Large vendors such as IBM and DEC believe it's important to supply computing on a full service basis - virtually no organisation provides a full line of networked, compatible, multi-vendor products.

Old line minicomputer and mainframe supplier markets will not easily be supplanted by new supermini suppliers because system pricing makes distributing one-product, low-priced, complex systems difficult.

Energetic and unique software applications (eg CAD) which run on a few energetic structures (PCs, workstations and superminis) will fuel this generation.

Unique structures (eg, home robots) are rarely revolutionary or protected by patents long enough to become established before the large supplier enters the market and takes over (eg, IBM dominates the PC market via its late entry).



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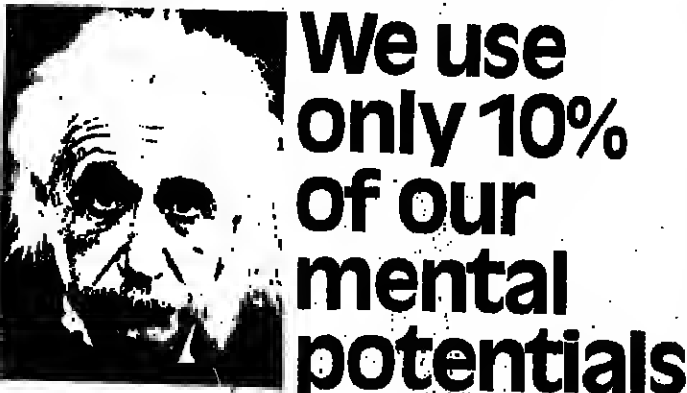
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Very accurate, very Sanderson.



A total of 710 buses like these are in four Sheffield garages with 560 on the road at peak periods.

How to keep track of over 700 buses

South Yorkshire Passenger Transport Executive's buses weren't keeping to time until it discovered the concept of radio data transmission

PICTURE 710 buses housed in four garages in Sheffield, 560 or more of them on the road in the peak hour, three buses a minute leaving the garages in the peak period, and timetables to be kept. There can be nothing quite as frustrating as having a well-defined and understood bus operating problem without being able to see a solution in sight.

In early 1982, that was exactly the position in which the South Yorkshire Passenger Transport Executive found itself.

In the day-to-day running of a garage, the pressure is on the regulator inspector. His job is to allocate the buses to each route and ensure that they leave the starting point on time.

Timetables, bus suitability and regular bus maintenance programmes all need to be taken into account so that the regulator knows the location and availability of all buses in the fleet.

So far so good. But the best laid plans are disrupted. No two days are the same. Breakdowns on the road ("crocks" as they are affectionately known), late starts, routes completed behind schedule, unplanned maintenance or cleaning - all upset the availability of buses.

Consequently, the regulator needs constantly up-to-date information from numerous sources - the central control room, which is in radio contact with all drivers, the fitters in the maintenance department, the garage personnel and even the three other garages.

And he doesn't just need to be aware of problems as they occur; confirmation that things are going to plan is just as vital.

The Executive was aware that, despite a lot of willing people trying hard with telephones, paper and verbal messages, the regulators were just not in possession of all the information they needed to do their jobs properly.

Research had shown that the information available between the control room and the regulators was an average 45 minutes out-of-date, too late to be able to put right anything that had gone wrong. The idea of communication between the garages and the control room needed improving so that everyone would be instantly aware of individual problems.

A central database of information stored in a computer system, with access available to the regulators and control room staff through terminals, presented only a partial solution.

Regulators spend a fair proportion of time away from the garage. If a bus fails en route, they need to know immediately in order to check bus suitability, location and availability quickly to dispatch a

replacement with the minimum of delay.

The Executive considered facsimile transmission between the garages and the control room, but all this achieved was another picture - another historical record. The Executive were on the verge of giving up, when a computer company contacted them.

Sanderson Computers was diversifying and had started to develop a hand-held terminal in early 1983. A hand-held device capable

No two days are the same - breakdowns, late starts, unplanned maintenance, cleaning - all upset the timetable

of two-way, real time communication with a distant computer system would solve the Executive's problem, thought Sanderson. It would also provide a marketable product suitable for a variety of applications other than traditional data capture.

An agreement was made to develop a prototype. The communication mode was critical. It must not inhibit the mobility of the regulator; it had to work without the risk of interference from vehicles and buildings, too. Infra-red and ultrasonics were both considered and discarded, but radio transmission was eventually chosen.

The first stage was to develop the prototype terminal so that real time communication between the terminal and a remote computer was possible.

Trials were successful, and Sanderson set out to develop a field-operational production model. Transmission speeds were improved and response times improved with the selection of a powerful multi-user microcomputer. General Automation's Zebra range fitted the bill and Sanderson became a dealer for that company.

Utilising the Pick relational database operating system, Zebra provided a proper database structure with an efficient language for systems development. Sanderson Computers also had had experience in developing commercial Pick systems.

During the summer of 1983, the passenger transport systems software was re-written and refined to run on a Zebra micro and production models of the terminal, now known as Script (Sanderson Computers Radio Interactive Portable Terminal) - were produced.

Script incorporates a CMOS

microprocessor (NSC 800) with up to 16K bytes of ROM; logic circuitry for minimising power consumption and reducing sensitivity to voltage variations; and it uses a replaceable, rechargeable nickel cadmium battery pack.

It has a range of up to two miles and weighs under two pounds. It has a liquid crystal display of eight lines by 42-key keyboard.

The keyboard layout is tailored to individual requirements to minimise the number of key depressions and speed up function selection. The screen can display an abbreviated version of a normal VDU format.

For the Executive this means that the regulator can use Script to access or update centrally-held files in the same way as he can at a conventional terminal in his garage.

Sanderson's passenger transport system is designed to control vehicle allocations for particular routes with pre-determined departure times. Routes to be allocated are displayed in time sequence order. By depressing a function key - find - the Script terminal will display the vehicles available and suitable for that timetable.

The information can, of course, be called up on the screen in the office. A bus is then allocated, and information regarding whether the vehicle is available for a full or part day is displayed. The regulator may then select dispatch, and the system will automatically record the departure time and change the bus's location to signify that the bus is on the road.

Up to six Script terminals may be connected to an intelligent base station, which is in turn linked to

The communications made must not inhibit the regulator's mobility

the Zebra micro installed in the garage. In a complete system all the Executive, a larger Zebra micro will probably be installed in the control room, if current trials are successful.

The control room inspectors, who are in radio contact with all drivers, can feed up-to-date information into the system such as crocks and delays, and so on. The garage-located Zebra will be connected to the larger central system. The latter constantly interrogates the garage micro for any changes to keep both files up-to-date and running in parallel.

Should a vehicle break down, another may be allocated to take its place from the same garage, another garage or from maintenance, by accessing the vehicle's available file.

The total system works in real time - everybody has access to the same up-to-date information. Instead of working with a time delay of 45 minutes, information is now only 15 seconds out of step with events.

The Executive has now installed

The regulators were just not in possession of all the information they needed

a General Automation Zebra 200 with 256K bytes of memory, 35 Mbytes of disc storage, four visual display units and an intelligent base station driving two Script terminals.

Before going operational in the garage, the system has been installed for training. Inspectors, both regulators and control room staff, who have welcomed and worked closely with the project, particularly in the design of the keyboard layout and function names, are jointly writing the operator manuals with management.

More akin to a day in the life of the system than a traditional manual, this will provide a reference for new users to see what should be happening at any time in a 24-hour day.

Training will be completed in early 1984, and the first garage will go live with the "bus output machines" as the Script terminals have come to be known among the inspectors. Initially, a 4800 baud communications line will link a VDU in the control room to the garage-located Zebra.

The intention is to avoid implementation problems as far as possible, with a fully tried and tested system and a trained staff.

Chris Longley, the Executive's operating systems manager, comments: "We have waited a long time to find what we believe to be the right solution, and we want to get it right. The co-operation of the inspectors has been very good."

"We want to start out with people believing in the system and with the equipment assisting regulators positively in performing their tasks with less pressure and more effectiveness."

The second phase will be to install additional systems in the three remaining garages; a larger Zebra processor in the control room; and the development of more extensive management reports.

PICK

Pick rewards its pilgrims

After two years Pick Systems has launched its new proprietary operating system. Jonathan E. Sisk analyses it

THE third annual Pick Spectrum Conference, sponsored by the International Database Management Association (IDBMA), provided a platform for Pick Systems to describe its newest products to several thousand devoted followers, who made the "pilgrimage" to the MGM Grand Hotel in Reno, Nevada, last month.

The announcements of the completion of the in-house implementation of the Pick operating system on the IBM-PC XT and of the release of the company's proprietary operating system called Open Architecture Release 1.0 were also made to the delight of those users who have waited patiently for Pick to deliver what it has been promising for the last two years.

For those unfamiliar with the Pick operating system, it is a virtual memory-based, multi-user operating system (OS) with an integrated database management system that runs on a wide variety of systems, from the IBM-PC XT to the IBM 4300 mainframe.

It is merely coincidental that IBM's name appears on both ends of the Pick implementation spectrum, as Pick also runs on such machines as the Honeywell Level-6, many Motorola M68000-based systems, the Intel 8086, the Zilog Z8000 and a handful of machines based on discrete processors, such as the Hewlett-Packard 3000 and the Microdata Reality and Sequel.

Users of the Pick OS maintain an almost fanatical loyalty to the product and its eclectic originator, Dick Pick, who is often referred to in the press as being the guru of this cult-like following.

In a recent issue of *Computer Systems News*, Pick was captured on a front page photograph hanging upside-down in his gravity boots. He was quoted as having

said that this position "makes him think better". An equally off-the-wall article in *Business Week* quoted "puckish Pick" as spelling the OS "Unix" "E-u-n-i-c-h-e".

His irreverence for traditional methods and approaches is only exceeded in its fervour by his devotion to the ongoing development of the operating system that bears his name.

Pick is especially proud of the new version, Open Architecture Release 1.0. It is a somewhat radical departure from the standards that he himself established back in 1971. Initially entitled R84, Open Architecture paves the way for the Pick OS to become compatible with the "real" world.

"This release is our response to all of the enhancement requests that we have received over the years from our users," Pick states. "A more appropriate name for the release would be Yes. It allows users to do virtually everything they have ever hoped for."

"The name, Open Architecture Release 1.0, was chosen to replace the previous convention of using the calendar year in which the release was made in the name. The last official release was R80."

"This does not mean that each new implementation since 1980 has been 'old' code. On the contrary, each licensee has been provided with the most current release of the system."

"Subsequent releases will be called 1.1, 1.2, and so on. When a major change is implemented, we'll call it 2.0."

Whatever the name, aficionados of the Pick OS have already learned that it provides an astonishingly high degree of application portability, both between new releases and even between different machines.

Pick has no intention of changing this phenomenon. Open Architecture 1.0 will be completely compatible with users' current application software.

Many new features have been added, which users may wish to incorporate into their applications, but none will be mandatory. Among these new features are:

- Multiple ABS areas. Virtual code for the Pick OS is contained in the ABS area. Historically, there was one ABS area per system, but with this new scheme, it will be easier to provide logical

Pick Systems will rebate \$50 to users who return the registration card

partitions so that other operating systems (or multiple copies of Pick) may coexist on the same system.

- Unlimited item size. Previously, data items were limited to a maximum size of 32 Kbytes.

- All frames are now 1K each. A frame is the means by which Pick addresses disc. In previous releases, frames for storage of data were each allocated 512 bytes, and ABS frames were either 512, 1,024 or 2,048 bytes, depending on the specific machine implementation.

The advantage gained is two fold: first, with twice as much data now being stored in a frame, more data will stay in main memory. This will reduce the number of disc accesses necessary to retrieve data. Secondly, the virtual object code will be better stored on disc. This will result in fewer disc accesses for OS code frames, because they will already probably be in main memory. The overall effect of the new frame size is a decrease in disc accesses and an increase in throughput.

- Simplified system interfaces. While this probably will be more appreciated by Pick's programmers, the end-users will still gain indirectly. The brave few that attempted to write Assembly code in the field had to follow logic paths across many frame boundaries when debugging their software.

Each system mode now has only one entry point, rather than multiple entry points.

- Linking loader. This is the process in which Pick Assembler object code is loaded on to disc. During the load process, all external references within the mode are resolved. This results in the dynamic resolution of all previously unresolved references to the mode at run time.

- Floating workspaces. Workspaces under the Pick OS are the storage areas into which data is moved during processing. Historically, these workspace areas were at absolute locations on disc, and each was fixed in length, typically between 66 and 127 frames (33-63K). The new scheme permits workspace areas to be assigned dynamically, according to the actual needs of the process, and are potentially limitless.

All of the above features of Open Architecture Release 1.0 will be transparent to its users. The only noticeable difference will be the increase in throughput.

Those features that are more likely to catch the attention of the public will probably be introduced in subsequent releases. Among these are: enhanced communications, including X.25 and SNA; the incorporation of a C compiler; the introduction of a CP/M emulator; executive statements in Pick/Basic, which will make it possible for programs to exit to any process and return control exactly where the program left off; TCL (Terminal Control Language) stack, so that users can recall, modify and re-execute any previously-entered commands; extended precision in

Pick/Basic, which will provide floating-point mathematical operations, utilising an extension whereby precision will be increased to 64 bits; and incremental file-save/transaction log.

Seasoned Pick veterans who have experienced power failures will particularly appreciate this last feature. Each time a transaction is written to disc, an image of the transaction is placed into a log file, where it can be immediately written on to a tape or diskette, or temporarily held on disc for the time specified by the operator.

The net effect is that the system is always backed-up. Should a machine failure occur, the user would simply load and restore the last file-save tape. Upon completion, the user would load the transaction log tapes generated since the last file-save, which would then load the updates that had occurred since the earlier tape.

A couple of other features to be introduced are Pick/Basic subroutines from Access dictionary items and phantom processes.

Access is Pick's English-like data retrieval language which uses dictionaries to define where data is stored and how it should look on output. While the Access language is a powerful tool, there are inherent limitations to its capabilities, due to its limited subset of functions permitted in dictionary items. With the extension, Access will be capable of performing complex tasks formerly available only in Pick/Basic programs.

Phantom processes will permit processes to initiate multiple background tasks, without tying up the terminal from which they were generated.

Overall, Open Architecture Release 1.0 provides the answers to the questions that sceptics of Pick have raised in the past.

The second major announcement is the availability of the Pick OS on the IBM-PC XT, using standard hardware configurations from IBM.

Priced at an end-user licence fee of \$495, this is a true full Pick implementation, offering all the same features and compatibility as

Almost all of their applications will port straight across

the rest of the Pick implementations. As an added incentive to end-users, Pick Systems will rebate \$50 to users who return the registration card enclosed in the package.

The base configuration supports three asynchronous terminals and a system printer. Pick on the XT totally supplants MS-DOS.

Users who wish to continue using non-Pick packages, such as Lotus 1-2-3 or Wordstar, may partition their disc into two or more partitions, using the FDISC command provided under MS-DOS 2.0.

The XT version of Pick has an FDISC command that allows users to change partitions without rebooting the system. Due to the special attention that Pick pays to the treatment of main memory, special protection software has been incorporated into the Pick XT so that the system has time to flush to disc all of the write-required memory buffers prior to shutdown.

Several implementation-dependent features are planned for the XT version of the Pick OS, including extensions to Pick/Basic that will allow use of either colour or monochrome monitors, along with all of the bells and whistles, including foreground and background colours, protected fields, visual attributes such as underlining, blinking and XY co-ordinate addressing for cursor control.

During the last year, two Pick

lookalikes have been announced on the IBM-PC. The first of these was Revelation, from Cosmos of Seattle, Washington. The second came from CDI Information Systems of Bellevue, Washington, the licensee for Pick on the IBM Series/1.

While neither of these products is claimed to be an exact replica of Pick, both offer products that have a moderate degree of similarity, especially in the area of their respective Basic programming languages and Access-like command structures.

Current Pick users who are potential customers for either of these products would be well-advised to investigate the technical differences between their current application software and the format required under the emulation. They may find that conversion costs could account for a hefty slice of their total investment.

The Pick implementation, by contrast, is a "pure" version of Pick. As such, almost all of their

applications will port straight across without conversion. Since most Pick-based systems use 1/2 inch magnetic tape as back-up media, a potential media incompatibility exists for users wishing to migrate to the XT.

For this reason, it is very likely that Pick will provide a means by which applications and data can be transmitted over asynchronous lines to solve this problem.

Clearly, the Pick OS is a system whose time has come. Pick was user-friendly before the term became popular.

With the introduction of this powerful system on the IBM XT, Pick Systems might jump off the springboard from its relative obscurity to become a formidable contender in the database management system marketplace.

Jonathan E. Sisk is president of JES & Associates, an Irvine, California, based firm specialising in services for the Pick operating system. He is author and publisher of *The Pick and The Reality pocket guides*.

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PAYE ticks along — but not without problems

Computerisation of PAYE drew cynicism when it was mooted. Judith Morris reports on progress

THE computerisation of the Inland Revenue's Pay as You Earn (PAYE) scheme is one of those sagas that will run and run, but cynics are beginning to wonder if the system itself will ever match the saga and run. The cynics would be surprised to find that behind the scenes, the system is quietly working away on schedule to complete the mammoth task of computerising the tax system.

The idea to computerise PAYE was introduced in 1980 when the chairman of the Inland Revenue, Sir William Pile, told the House of Commons that the system would be up and running by 1982. The year before, Sir William had told the Commons that it was "an appalling state of affairs" that the Inland Revenue was not compu-

terised and was using "such antiquated technology and equipment".

But four years later, the massive plan to change the tax system — which at £200 million represents one of the biggest orders ever placed by government — is still far from completion. The plan has been beset by difficulties right from the start, and many people never believed that it would work anyway.

The Inland Revenue itself has suffered from changes in government. One of the first delays to computerisation was caused by the Heath government halting plans so that it could bring in tax credits, which were in turn dropped by the last Labour government.

The original scheme, thought

out back in the 1960s, was to centre all clerical and data processing work in one building along the lines of the Centre 1 scheme in East Kilbride, Glasgow, which runs the Scottish tax system.

But the Scots found that they

Instead, an alternative scheme was proposed, which turns out to be the one being implemented, albeit after several "rethinks" when the Cabinet thought the sophistication of new proposals could lead to embarrassing breakdowns. It was

One of the first delays to computerisation was caused by the Heath government halting plans so that it could bring in tax credits

were experiencing long delays in getting replies to their inquiries, and it was becoming increasingly difficult to lure experienced staff to the grim outskirts of Glasgow, where highly qualified personnel were needed to cope with the demanding and responsible work.

also concerned that a lack of skilled DP staff in the Civil Service could lead to a DVLC-type fiasco. The proposals were drawn up by the Inland Revenue, the Department of Industry and the Central Computer and Telecommunications Agency (CCTA). They

involved the setting up of 12 regional tax centres which would each monitor the entire tax operation throughout the year. About 17,000 terminals would link about 600 regional offices to the 12 processing centres holding taxpayers' records.

But just because the nature of the system had been chosen did not mean that the matter was settled by any means. Afterwards came the heated battle over the juicy contract. And it was a fight in which everyone — government, unions, MPs, UK firms, US firms — jumped into feet first. Patriotism, competition and uglier emotions ran high. No-one could afford not to have a say in the debate over the plummiest contract to be up for grabs for many years.

What happened is history now. ICL scooped the mainframe contract with its 2955 and 2966 systems, launched in November 1980, and followed it up — a mere two years later — by winning the contract to supply 17,717 DRS 20 desktop terminals.

The deal could not have been made at a better time for ICL, but with the good publicity came the bad; many cynics took the opportunity to say that it was the government's Buy British policy that had clinched the deal and not the quality of ICL kit — and the Americans went away with their tails between their legs muttering that it was all a fix.

So far, so good — but it is now 1984, and what has been accomplished? Some of those involved in the project from the start believe it is going very well, all the more so because "no-one would believe it would ever happen".

The first stage of computerisation is now well under way. One site, at Telford in Shropshire, has been chosen as a pilot site with the aim of ironing out all the bugs there before the process is repeated at 12 other regional Inland Revenue sites. The Cabinet shied away from an original "big bang" plan to computerise all 12 sites simultaneously.

On the other hand, the inevitable problems have arisen — the most obvious being the refusal of the Inland Revenue staff to use the new equipment until management agree not to impose compulsory redundancies. About 400 staff stand to lose their jobs through computerisation of the PAYE system.

The fact that the problems accompanying the scheme were as human as was raised as long ago as November 1980, when the Tory Bow Group produced a pamphlet, written by Philip Vergo of Logica and Industry Minister Jobo Buncher, who was then a mere MP. The pamphlet set out to define the potential difficulties to computerisation of the PAYE system and pointed out that the actual processing equipment was basically straightforward. The main hitch was that IR management and staff were too concerned with what was political rather than what was practical.

This warning has been true, in so far as concern that computerisation would lead to redundancies has led to some industrial action, recently resolved, which has naturally held up progress. Members of the Inland Revenue Staff Federation (IRSF) have now accepted a new technology agreement, after 400 tax officers who had been "suspended" following their refusal to work with the new equipment were recommended for reinstatement.

Many of the problems arise because of the peculiar nature of the



Pile... He started it.

Sir William told the Commons it was an "appalling state of affairs" that the Inland Revenue was not computerised

Civil Service, which has a shortage of skilled computer staff and finds it difficult to retain and recruit them because of its strict salary and grading structure.

The federation's recent agreement has irritated other Civil Service unions, still awaiting any technology agreements to be made with the government, who have hoped for a single Civil Service deal including a "no compulsory redundancies" commitment. The agreement does not guarantee that there will be no redundancies because of computerisation, although the government has said that "it will do its utmost to avoid" any losses.

Any Inland Revenue staff who lose jobs may well be redeployed to other Civil Service departments — another boon of contention, as other Civil Service unions regard a "no replacement of staff" agreement, and friction could arise if federation members need to transfer to other unions.

To minimise this difficulty, a joint employer-union expert group in the 14 West Midlands districts has been set up for the determination of working arrangements — a step which could lead to drastic changes in Civil Service working patterns, desperately needed if computerisation of major departments is to go ahead.

But not all the problems posed by PAYE computerisation stem from manpower. For ICL, the system was its shining star, an chance to be judged by the systems market in general. It could not afford a repetition of the DVLC shambles in Swansea, which it got a first deal in.

ICL was especially sensitive at the time of the PAYE tender for it won the contract

Continued opposite

PAYE proceeds but not without its problems

From page 22

the back of two large systems which were not even on the market then.

But the Inland Revenue is more than satisfied with ICL's performance to date. Steve Matheson, who is the project manager for the PAYE computerisation and has been involved with the project since 1978.

"Ten staff are actually involved in line management," says Matheson. "This is all part of the structure of the project which comprises consultants, civil servants and ICL staff."

"This system works very well," he comments. "The consultants don't just give technical advice, they give direction as well, which is very important. It means they can't just suggest things, give advice and walk away from it leaving someone else to sort it out. They have to make it work without people."

Although the consultants are not intended to be a permanent feature of the Inland Revenue scheme, their presence is supposed to ensure that their specialist skills, be they in management or technical matters, will eventually be passed on to civil servants.

The other company directly involved in the project is Paces, which has provided an automated control system.

"We are monitoring about 20,000 to 30,000 different activities, so we needed a very sophisticated project control system. This is a major tool for keeping all the development work on time," says Matheson.

The major activity now for the Inland Revenue team is planning for the conversion of the 6,000 local offices, which vary in size enormously. All of them will have to be rewired for the DRS 20 terminals, and the scale of the task is staggering.

ICL was specially sensitive at the time of the PAYE tender for it won the contract on the back of two large systems which were not even on the market then

"About 20,000 staff will have to be retrained and about 27 million tax records will have to be converted," Matheson says. "And then about 1.1 million employer records will have to be converted, too. Eventually, there will be a database of about 100 gigabytes."

As technology and the law change, so too will the Inland Revenue's system. There is a clause in the agreement between the government and ICL which actually allows for taking advantage of changes in technology, so that the system is not static and will change according to continual development.

For example, the ICL 2966 machines will be upgraded to 2988s, not because there was anything wrong with the 2966s, but just because "that's the way things were going".

Matheson also expects that when the Batel "supercomputer" which ICL is building with advanced chip technology from Fujitsu, is available, the Inland Revenue will get one for testing.

"People here are working on that already," he says. "There is a great deal of on-going testing work. A super dual 88 is being built which will take us on the path to the Batel. We may not do it at the end, but we have to do the testing."

The extension of ICL's CAPS to the new CAPS ISP has also increased the confidence of the Inland Revenue in the system, and it has been piloted at the Centre 1 site in Glasgow. Because CAPS' main advantage is in fuzzy matching, names and addresses of the public can now be matched up to

working on the development team at Telford.

Computer Sciences Corporation (CSC), the UK arm of an American software house, provides technical support and technical management and has been involved with the project since 1978.

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employer and local tax office without having to send out those irritating letters which infuriate everyone.

CAPS immediately brings up a National Insurance number — the key for all the computer records — when given a name and address or even part of a name and address, and everything can be traced without having to trouble the employee.

An efficient tax system is viewed as an anathema by most people. The Inland Revenue has long been the butt of jokes. The computerisation of the system has aroused the public interest and has had a great deal of media attention. But it looks certain that the lessons learned at the DVLC in Swansea will not be repeated by the Inland Revenue, or by ICL.

Both organisations have taken considerable trouble to iron out difficulties before they become insurmountable, and the careful training of staff should ensure that the predictions of the Bow Group never come true.

Judith Morris is editor of Computer Talk.

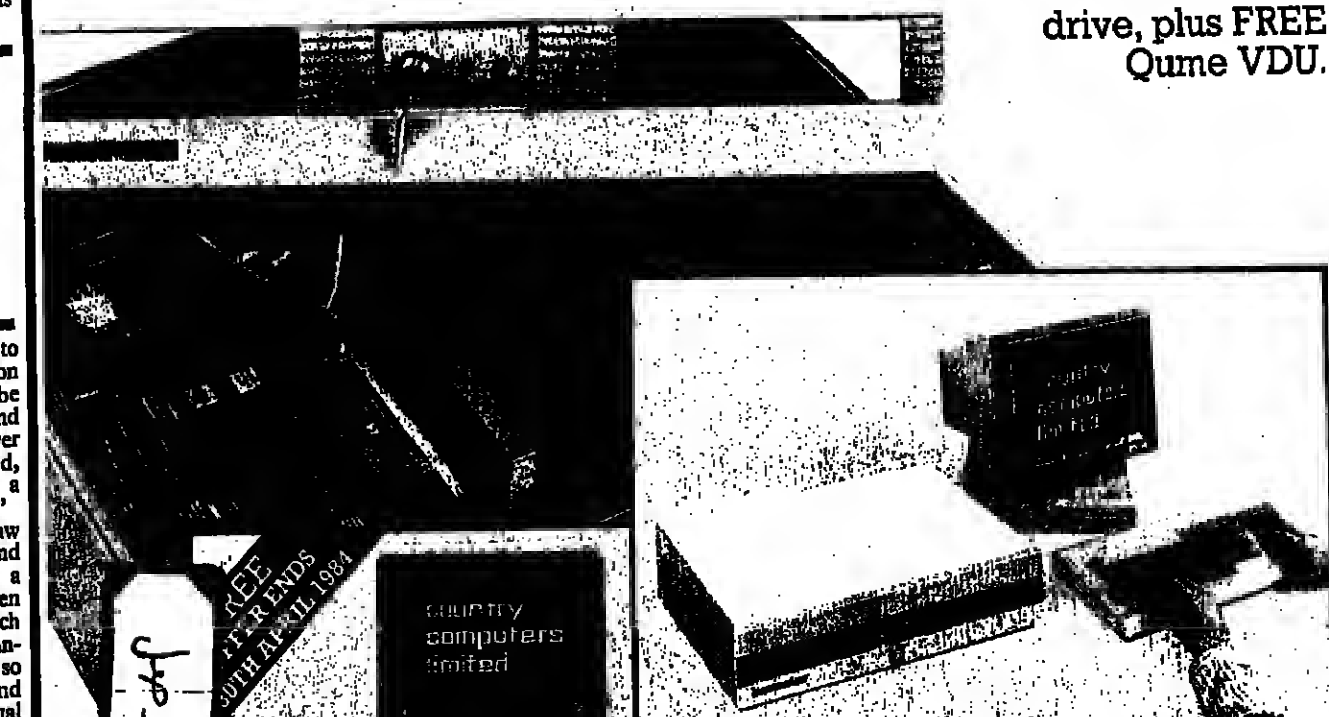


Authors with foresight... BUTCHER (left) and VIRGO (right).



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SOFTWARE MONTH

Mainframe package vendors face a personal challenge

Their task is to link personal computer applications to mainframe databases. How do they go about it?



THE astonishing growth of the personal computer, claims Mark Bennett, manager of the Systems Software Division of RTZ Computer Services, has presented traditional vendors of mainframe package software with a new challenge.

"The availability of local processing capabilities has highlighted a requirement for immediate access to the centralised corporate data on the mainframe databases," he says. "The challenge is how to provide that access in a meaningful and useful way."

The task is to link personal computer applications to mainframe databases. But the problem is that there are many applications on many different microcomputers, all needing to link to many databases on many mainframes. It could be called a problem of multiple many-to-many relationships.

Clearly there is no simple solution. The complete answer would be to design a new mainframe database with its own universal

The complete answer would be to design a new mainframe database with its own universal communications capabilities

communications capabilities to a new set of universal and integrated personal applications. But this is not likely. The project is too large, and it would still depend on the ability to persuade existing users to abandon existing databases and existing application programs.

There has to be a compromise, and it is in the area of compromise that most of the current solutions differ.

First, however, we should look at a statement of the requirements of a mainframe to microcomputer connection.

Bennett thinks these are fourfold. "Firstly, selectivity. This is the key to the micro connection in business situations, because working with too much data, if it doesn't overload the micro, is as meaningless in a business situation as working with too little data. The link needs to be designed to process only a personalised amount of data - the data needed to enable the right decision for each problem."

"Secondly, database access. Given the way most applications systems have been developed historically, it is unlikely that the data required on the manager's desk comes simply from one system. It is likely to be scattered across several files or databases. Some means of pulling this data together is required."

"Thirdly, security. The ability to access across several applications requires that strict security be applied to the lowest item of information on the files, especially if real time updating is to be performed."

Finally, the results of the local processing should update the files in real time without some intermediate batch process.

Many software suppliers, con-



BENNETT... "The challenge is how to provide that access in a meaningful and useful way."

sider that Bennett's third and fourth points are incompatible. Such suppliers question the usefulness of updating a production database with the results of local processing. This is certainly the view of Informatics, its marketing manager Rayno Shroff explains that the executive user requirements do not usually include updating the database, but merely interpreting it. The data traffic need therefore be only one way.

"But what we are looking at," Shroff continues, "is the use of the mainframe as a mail box for the results of local processing. In other words, the results of sales models from divisional sales managers could be made available, via a mail box facility, to other managers and to the group sales director."

It may be worth relating some of the packages available. Bennett describes the system from McCormack and Dodge, the In-

In two of the PC Links methods of downloading data: selective and chained.

"Selective downloading," he continues, "depends on the in-built query function within Millennium - an English-like language with Boolean logic facilities. It uses an inverted list index which will allow any VSAM file to be accessed by the content of the record as well as the key."

"The chained download allows a set of stored queries to be executed in any desired order. This enables several different files or databases to be accessed in the same selection."

The Link's security is based on that within Millennium. "It is a user defined facility which can allow the real time configuration of access and update restrictions. Passwords protect the application, function, screen, field, search value and logical query; and access can be further limited by time of day and day of week."

"The output interface for uploading," Bennett concludes, "is a file which the upload interface can map into normal CICS message format. Its mapping facility places the micro data in the correct fields in the mainframe message. Uploading is a real time

process. As a result, the revised information is immediately available for further downloads and revaluation."

One of the best know of the mainframe to microcomputer links is Executive Peachpak from Management Science of America (MSA).

MSA director Stuart Walsh explains how the system matches the requirements specified by Bennett: "The PeachLink communications software enables the user to select online any combination of Individual fields from MSA's mainframe systems database and to transfer the current contents of those fields for a specified range of records directly to the personal computer in an online real time environment."

"No intermediary files are created, so the data extracted is taken directly from production files and the information is always the most up-to-date available, thus conforming to the real time selectivity criterion."

The ability to access different databases is less vital or relevant to Peachpak II since it is designed primarily for MSA proprietary databases. Security, however, is handled at both mainframe and microcomputer levels.

SOFTWARE MONTH

Double luck provided answer

Two coincidences gave rise to the VisiAnswer PC-database link

INFORMATICS General Corporation, one of the giants of the software world, which historically has specialised in 370 architecture on IBM mainframes, has now added the PC to its repertoire.

The move started about five years ago, before the PC had arrived, but at the height of the rise of the micro. Rayno Shroff, the company's marketing manager, explains that at the time the company realised the microcomputer had come to stay, and that the market would specifically need a way to link the micro to the mainframe.

Informatics started by buying an Intel microcomputer and developing methods of linking it to the mainframe.

About two years ago it was realised this was a mistake, but at the same time the first of many happy coincidences occurred - IBM launched its own PC, and forced new standards and maturity on to a previously fragmented microcomputer market.

Overnight (almost) software vendors were given the sort of microcomputer prospect pool that had not been seen since the heyday of CP/M-80's eight-bit domination.

The arrival of the PC came at exactly the right time for Informatics: lessons had been learnt on the Intel, but irreversible steps had not yet been taken. One of the lessons had come from a re-appraisal of the needs of the PC user - who is not the traditional 3270 user with whom mainframe software vendors are familiar. The 3270 user wants reports or, as Shroff puts it, "he wants financial or industrial archaeology - information on and from the past."

The PC user also wants information, but information from which to predict the future. "The PC user is an executive skill worker who wants to work in planning mode. PC user-friendliness is completely different from 3270 user-friendliness, so we knew we had new lessons to learn," says Shroff.

At that time Merritt Lutz, group vice-president, Software Products Group, began to look for an association with a micro software specialist.

And then came the second great coincidence. At the same time Dao Bystra, of VisiCorp, having travelled the same route in reverse, had begun to look for an association with a mainframe software specialist. It is from this association that VisiAnswer was born.

Each side, says Shroff, learnt from the other. VisiCorp knew how to interface with the naive executive user, and we knew how to interface to the mainframe production database. The result is VisiAnswer.

There is one more great coincidence: the history of VisiAnswer, one that is embodied in its name. VisiAnswer is a contraction of two names - VisiCalc from VisiCorp, and Answer/DB from Informatics.

Answer/DB sits on the main-

frame and is able to interrogate almost any standard 370 architecture compatible database, including IDMS, Adabas, Total, IMS, DLI, and so on. By interfacing VisiAnswer to Answer/DB, Informatics was able to link the PC to a variety of different databases at a single stroke. So it immediately fulfils two of the four criteria laid down by Informatics for the product. "It is," Shroff says, "both universal and selective. It is universal at the mainframe end (in that it interfaces to all databases) and selective at the PC end (since the user can select precisely that information he wants). It is not just a file dumper."

The other two criteria include a naive interface (gained courtesy of VisiCorp), and absolute security.

There are two aspects to database security: sensitive information must not be available to those unauthorised to see it, and the en-

"The PC user is an executive skill worker who wants to work in planning mode"

tire database must be protected against accidental or malicious corruption.

VisiAnswer has two main protective devices. The first is that it is simply a no-update system. Live data may be drawn from the database and processed on the PC, but it may not be returned to the database.

The second protective device lies within the Answer/DB portion of the system. Each user is given a user profile that defines access authority down to individual field level within any number of files from up to 10 different databases.

Junior personnel clerks, for example, could be restricted from access to the personnel data of staff salaried at above a certain level. This profile then relates to a password on the individual VisiAnswer floppy discs, which are themselves set up and controlled by the DP department. The result is that VisiAnswer can be run from any IBM-PC anywhere in the world (provided only that it can be connected to the mainframe), but only in conjunction with a valid password and within the restrictions associated with that password.

The naive interface includes all the tricks learnt by VisiCorp's many years of successful involvement with the microcomputer. Each VisiAnswer disc working through the PC knows precisely all the file structures available to its own user.

A question and answer sequence guides the executive through the process, at all times stating what has been done, explaining what can be done and prompting for what should be done. And if this isn't enough, PC quality help files are also available.



LUTZ... Wanted specialist.



BYSTRA... Was looking for an association with a mainframe software specialist.

When the task is defined, VisiAnswer translates it into a series of Answer/DB commands, which in turn retrieve the specified information from the production

database and send it to the PC. At this point VisiAnswer can convert the retrieved data into a VisiCalc data file which can then be processed locally by the VisiCalc

spreadsheet program. Since a defined task can be stored by VisiAnswer, the user soon establishes a library of selection routines to cover his most

used selection criteria. At the moment VisiAnswer can interrogate many different IBM databases, but links only to the one PC application.

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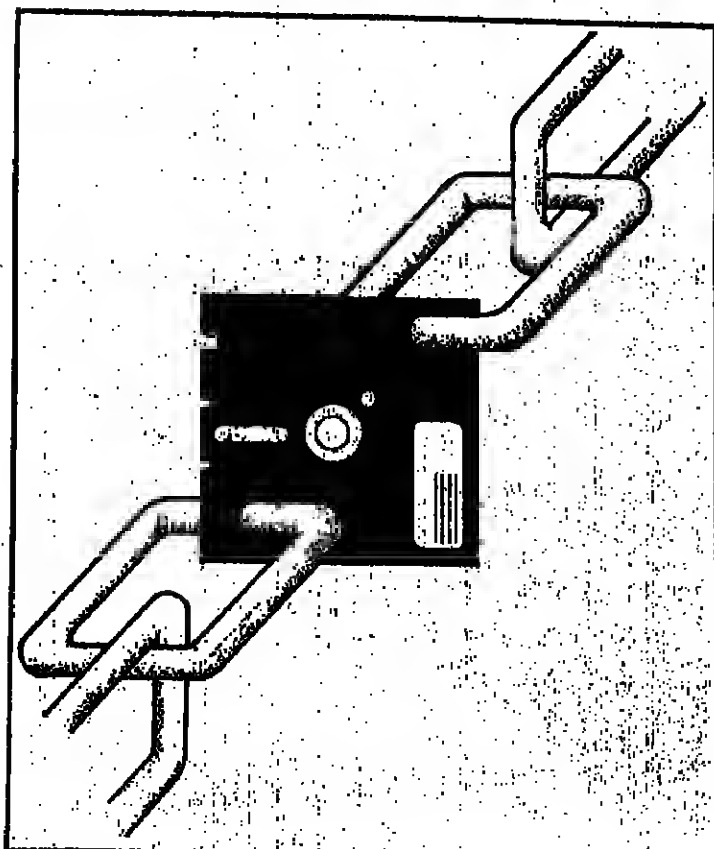
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A dBASE II User Group has been formed. For further details contact User Group Secretariat Caroline Tanner on 0908 568866.

WALSH... "Ability to access different databases is less vital or relevant to Peachpak II."



How IBM has brought micro respectability

Like it or not, IBM's PC has changed microcomputing

WHETHER you like the company or not, you cannot ignore IBM. For the IBM-PC is changing the face and structure of microcomputing. The hardware is already technologically dated, but it has done more for the microcomputer market than any other product, hardware or software, since CP/M80.

It has brought respectability to the market; it has given the major and senior mainframe software vendors a sufficiently large and

stable target to justify sophisticated software. And this software, in the form of mainframe to micro links, is drawing the microcomputer, grandchild of the mainframe, up into the adult world of serious computing.

With one or two exceptions, the vast majority of mainframe to microcomputer links are IBM database to IBM-PC links. But within this conformity there are many different levels of solution, albeit largely with one basic similarity: the majority of solutions depend on some form of interpreter, whether it is primarily hardware or software or both, that sits between the PC and the mainframe and translates the required format of one to the required format of the other. It is the complexity of this intermediate interpreter that defines the extent of the solution.

At its simplest level it is little more than a protocol emulator, allowing the PC to "talk" to the

mainframe with all the major communications protocols. But, since it can support up to 2,000 bytes of its own Winchester storage, and can run its own word and data processing applications, it can be used to bind together a corporate DP structure diversified by the past acquisition of a large number of different mainframe and large minicomputer systems.

A different approach to the micro/mainframe problem is at a level somewhere between simple 3270 emulation with basic file transfer, and the true package file transfer, such as the VisiAnswer, Peachpak and others. An example here is the Host Interface Manager developed by IBI Computing, the computing arm of the IBI industrial manufacturing group. This package is basically a file transfer system (bi-directional), but it also enables the central DP department to customise and simplify PC access to the mainframe.

Basically comprising its own programming language, it is able to present the PC user with a menu of the available options, whether they are PC resident or mainframe resident, and to perform the relevant logging-on and software loading requirements that are necessary for each different menu specification.

David Williamson, managing director of IBI Computing, says: "Host Interface Manager was originally developed for use within IBI. We standardised on IBM's SNA because it is already central to the way we communicate around the company. We've already got nearly 400 terminals connected via 3270 clusters and IBM 8100 communications processors to our host 3033N. And these are rapidly being supplemented by a growing number of personal computers."

"We perceived the micro, and more recently the IBM-PC, as an additional opportunity rather than a threat to professional data processing, and have consequently set about integrating the new facilities with those already offered by our Information Centre."

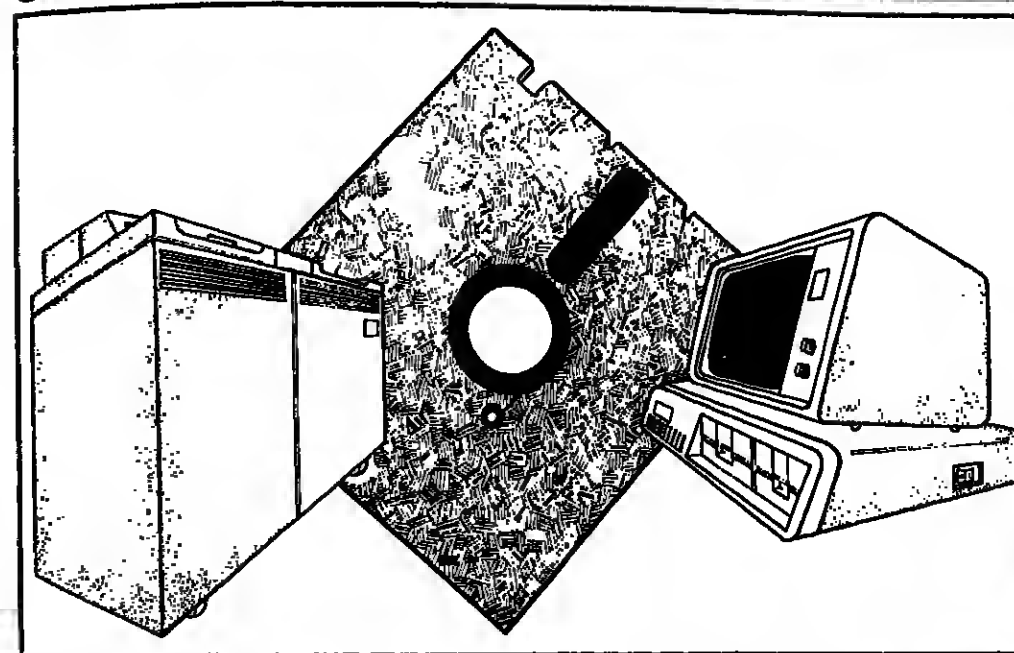
"While it is easy enough to connect the PC physically to the mainframe, it is not so easy for the end user to get access to the particular piece of software or data he requires. The end user just wants to see a menu of his applications, whether they are run on the PC in native mode, whether they access data from the host, or are entirely run on the mainframe."

"They may be a combination of text, graphics, and spreadsheet. Hence the need for a product like Host Interface Manager."

One of the simplest software links can be made where a package has already been implemented on both micro and mainframe formats. If the two systems are truly file compatible, then the link need be little more than a file transfer utility. Software where this is possible would include some of the major financial modelling systems, like Final from D. M. England and Partners, the Ward range from Comshare, and Finar from Corporate Modelling Consultants. Another example is IFPS from Package Programs Ltd. Rod Taylor

Continued opposite

SOFTWARE MONTH



IBM brings respectability

From page 26

lor, chairman and managing director, talks about his company's philosophy: "The demand for better software links between personal computers and corporate information centres, is growing rapidly as more and more managers make use of microcomputers as decision support centres."

"These links must operate on both personal computers and in mainframe environments and should facilitate the transfer of information from corporate databases to personal computers and back again. They need to be powerful enough to accommodate the far-reaching demands of users throughout the corporation and they must also be flexible enough to adapt to needs that differ from one department to another, and even from one user to another."

"This facility is available to users of IFPS and IFPS/Personal. IFPS/Personal models can be solved by mainframe IFPS, and mainframe access to the models and data on the mainframe while allowing to each user of IFPS/Personal complete flexibility to interrogate and change the assumptions in the models on the PC. The corporate planner can consolidate the individual user's model with the mainframe IFPS and distribute access to all users of IFPS/Personal."

"It is," he adds, "an example of how technology has developed to the point where users no longer have to conform to the requirements of the computer. By reflecting individual users' requirements, such new software tools will result in more responsive systems and a more creative and individual approach to management."

Richard Joyce is product manager of Network Systems Corporation. "When you look at the total problem of micro to mainframe communications," he says, "there are two distinct aspects to it. One is a networking problem, the other an applications problem. Network Systems has, since the mid-1970s, been addressing the networking problem. With the release of our Netex Network Executive software in 1981, we solved this networking problem. In Netex we have a deliverable, stable, high performance end-to-end networking structure, which conforms to OSI (Open Systems Interconnection) standard, Level 5 Session Layer. There are now over 300 Netex installations around the world."

"The applications problem, however," he continues, "is much more intractable, and one that will only be solved only by an internationally agreed standards solution. This will clearly take many years to reach, since it must be a rationalisation of the many, varied and growing number of dissimilar proprietary DBMSs and FMSs. Under the weight of our users' demands, and as an interim measure, we have implemented a Bulk File Transfer (BFT) facility. BFT effectively creates Remote Job Entry facilities between dissimilar vendor machines. This

allows, for example, an IBM-PC to communicate with an IBM 370, DEC Vax, Cray, and so on.

"Towards the end of 1984 or early 1985 we shall release our Interactive File and Record Transfer (IFRT) facility. This will provide users with the kind of file transfer facilities already existing between proprietary networks like DECnet and PrimeNet. The difference is that it will allow file transfer across dissimilar machines."

"For the moment, however, the days of data item update across dissimilar operating systems and machines, both locally and remotely, are still a long way off."

If the problem is to transfer data quickly, easily and securely between the PC and the mainframe, then one obvious solution is to design a software package that does everything for you, and provides a bridge between existing mainframe databases and existing microcomputer applications. But another obvious solution is to design a new and integrated package to deal with data on both the mainframe and PC simultaneously. This would clearly be an expensive

"The applications problem is much more intractable, and one that will only be solved only by an internationally agreed standards solution"

process, but one that we can expect to see in the future.

Meantime, both Hoskyns and Cullinet have compromised by acquiring or developing an integrated set of micro packages (KeepIt for Hoskyns, and the Cullinet PC Software); and developing a linking method to an existing mainframe database (Hoskyns's Ram II from associates Mathematics, and Cullinet's IDMS/R Codasyl database).

Cullinet's CPCs is an integrated set of PC software tools (spreadsheet, text editing and formatting, graphics and a relational database) that can be linked to the mainframe IDMS/R via the Information Database (IDB). This is a mainframe package that serves a purpose conceptually similar to Informatics' AnswerDB/VisiAnswer. It lies between the PC user and the mainframe database and acts as an interpreter. The only real difference is that IDB links only to Cullinet's proprietary IDMS/R database, while the Informatics' product links to any mainstream IBM database.

"That said, the detailed difference between the products is more extensive. IDB serves two main purposes: as an intermediate repository of up-to-date data, and as a network manager for the different PCs. The latter is achieved by allowing PCs access to the same corporate data within IDB while at the same time allowing the system to be used to provide a mailbox facility.

"The effective link of PCs to a mainframe cannot be provided by file transfer software and terminal emulation hardware/software"

tain either physical data or real-time logical views of the production data.

Philip Dyer, technical director of Cullinet, comments: "The effective link of PCs to a mainframe cannot be provided simply by file transfer software and terminal emulation hardware/software. The Cullinet Information Database used in conjunction with Cullinet's PC software provides an intelligent and transparent link between the mainframe, where data security and integrity are easily controlled, and a PC, where the power to drive end-user type tools is readily available."

"The mainframe provides an ideal vehicle to store end-users' information which has been created on a PC. With Cullinet's Information Database this storage is protected by standard security and back-up routines - which is a much better solution than trying to copy 10 megabytes to floppy discs."

"By using Information Database, information that has been created on a PC can be held on a mainframe and also be available for other authorised PC users. But more importantly this information can also form part of the company's database and subsequently

be used in large-scale, high performance production systems. "The Cullinet Information Database allows a controlled flow of information to - and very importantly from - the PC user. Data collected by PC users has already been paid for by the company. Using Cullinet mainframe/micro software this data is available for use by other employees subject only to the user's authority."

By the concentration of marketing effort on the corporate PC as an executive workstation should not be allowed to hide all the other uses of the microcomputer. Micro Focus, a UK company much in the news recently with announcements of increasing profitability and hints at future acquisitions, last year moved out of London to rural Berkshire, and in the process installed something like 14 kilometres of communications cabling in its new offices, with the avowed intention of putting a networked IBM-PC on every employee's desk.

Peter Hewitt, the company's marketing manager, explains the rationale: "The scenario we envisage, is one in which both software developers and application



DYER... "Ideal vehicle."

end-users can enjoy micro-to-mainframe facilities.

"For the software developers we will provide tools that allow the programmers to work on a microcomputer rather than on a mainframe. These, unlike the mainframe, are naturally interactive, providing an excellent program development environment."

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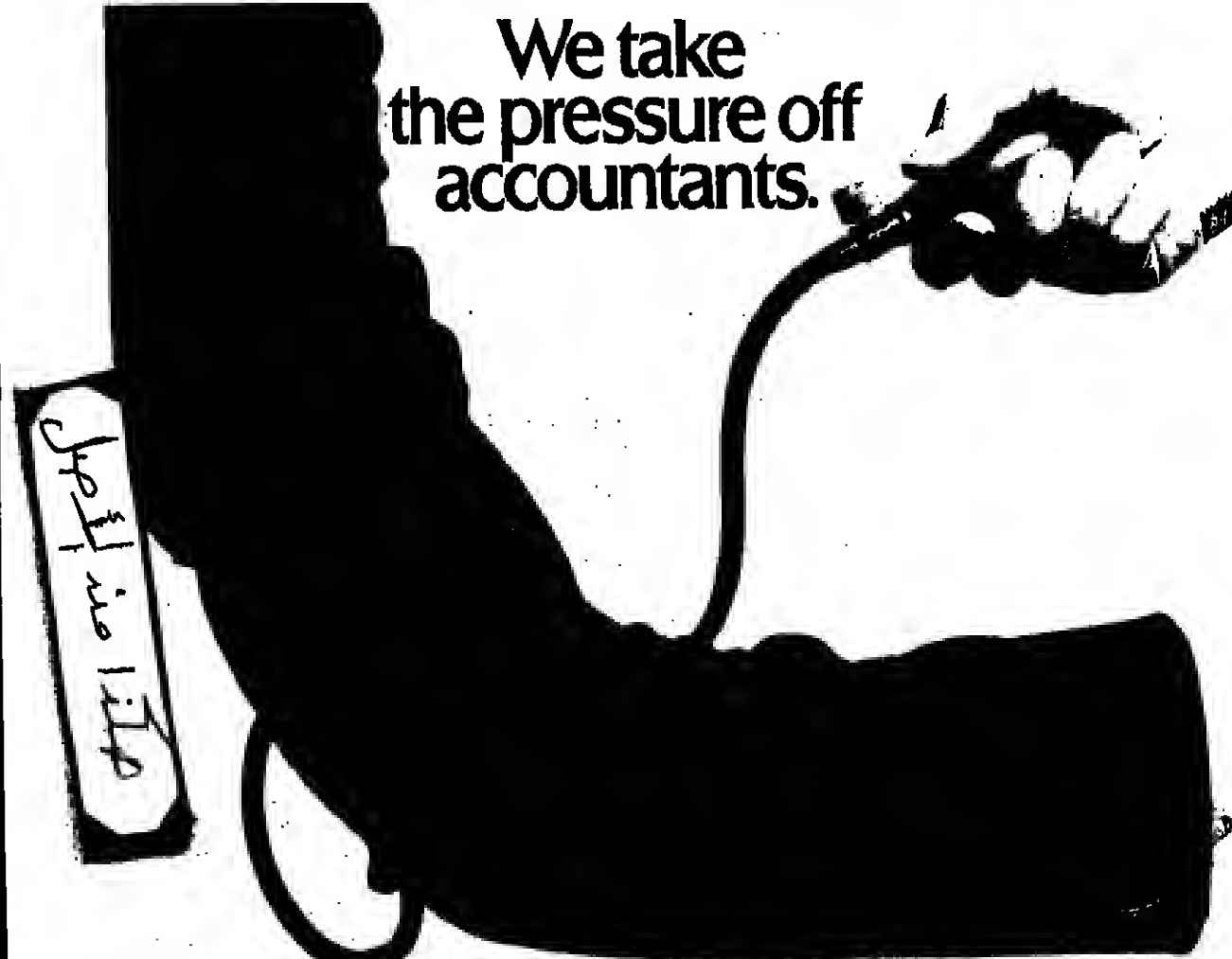
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SOFTWARE MONTH

Where to get the tools to form the links

THE following survey of software tools to link personal computers to mainframes covers most known products but should not be regarded as exhaustive:

ADP Network Services

179/193 Gt Portland St
London W1N 5FD
Tel: 01-388 1912

Product: Datapath

Mainframe: DEC 10, DEC 20
Software: TSAM, Screen, Fastlog
Micro: IBM-PC, XT
Software: Lotus 1-2-3

Software to software: yes
Mainframe updates: yes
Product: ADP Remote
Mainframe: DEC 10, DEC 20
Software: IPL, Ingres
Micro: IBM-PC, Rair, and anything supporting C
Software: Decas (screen formatting and data capture)
Software to software: yes
Mainframe updates: yes

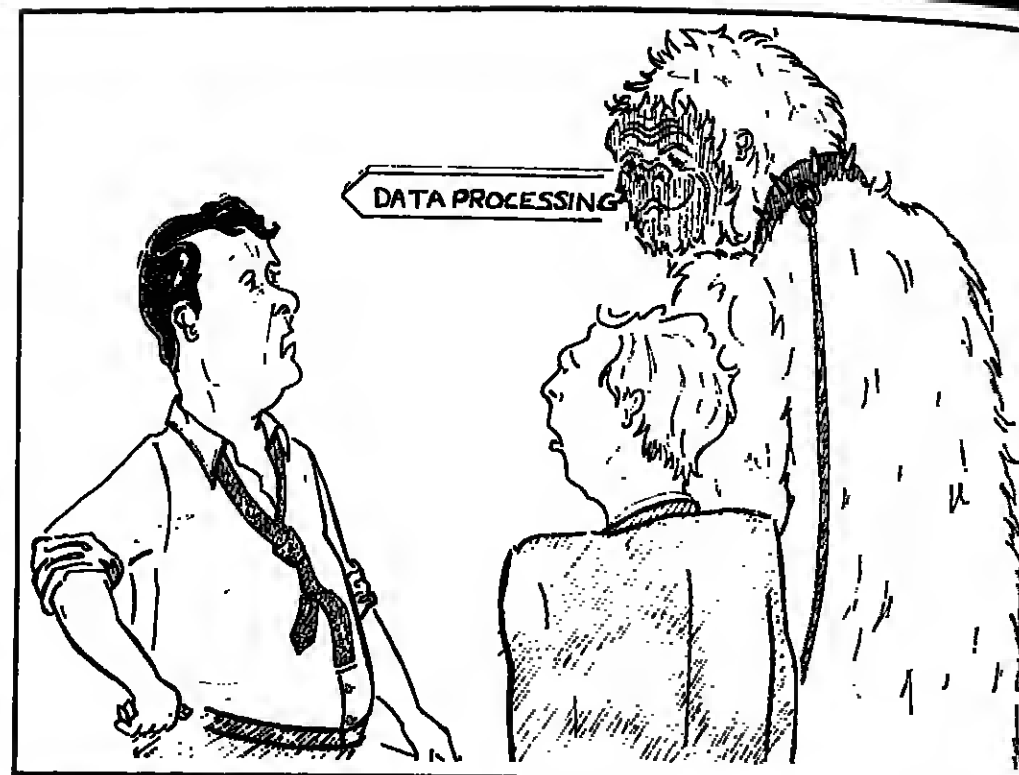
Cullinet Software

Cullinet House
82 The Broadway

Stammore, Middx HA7 4DU
Tel: 01-954 7333
Product: Cullinet PC Software
Mainframe: IBM
Software: IDMSIR+Information Database
Micro: IBM-PC
Software: PC-DOS
Software to software: yes
Mainframe updates: yes

Digital Microsystems

Molly Millars Bridge
Molly Millars Lane



Not that kind of link, Smith!

Wokingham, Berks RG11 2PQ
Tel: (0734) 793131
Product: Hinet
Mainframe: IBM, ICL, HP, CMC
etc
Micro: DMS, CIU

Hoskyns Group

64-78 Kingsway
London WC2
Tel: 01-242 1951
Product: ITSeries
Mainframe: IBM
Software: almost any, particularly Ramin II
Micro: Now IBM-PC, XT. Soon HP 150, Wang, Digital
Software: ITSeries, plus a number of 3rd party standards
Software to software: no
Mainframe updates: yes

Husky Computers

PO Box 135
Foleshill Road
Coventry CV6 5RW
Tel: (0203) 668181
Product: Husky and Husky Hunter
Mainframe: any 2780 compatible
Micro: Husky hand held computers
Software: CPIM
Software to software: yes
Mainframe updates: yes

Informatics General (UK)

Africa House
64-78 Kingsway
London WC2B 6AL
Tel: 01-242 0770
Product: VisiAnswer
Mainframe: Any 370 architecture IBM or compatible
Software: Any mainline IBM-compatible DBMS
Micro: IBM-PC, XT
Software: PC-DOS, VisiCalc, VisiOn (others coming)
Software to software: yes
Mainframe updates: no

Interactive Data Machines

Searchlight Hall
Great North Road
Doncaster
S Yorks
Product: Pick operating system
Mainframe: IBM 4300
Software: Pick on the mainframe
Micro: IBM-PC
Software: Pick on the PC
Software to software: yes
Mainframe updates: yes

Management Decision Systems

Old Crown
Windsor Road
Slough
Berks SL1 2DL
Tel: Slough 74201
Product: Express-Mat
Mainframe: IBM, Prime
Software: Express-Mat
Micro: IBM-PC
Software: Express-Mat 1-2-3, VisiCalc, dBase II
Software to software: yes
Mainframe updates: yes

Management Science of America

MSA House
Cedar Road

Maidenhead SL6 1SA
Tel: (0628) 38242
Product: Executive Peachpak II
Mainframe: IBM
Software: all commonly used database management systems
Micro: IBM-PC, XT
Software: All Peachpaks, plus 1-2-3, VisiCalc, dBase II, and DIF files
Software to software: yes
Mainframe updates: yes

Mathematica

79-83 Portland Street
London W1N 5RA
Tel: 01-580 3681
Product: Ramin II-Ramlink
Mainframe: IBM and compatible
Software: Ramin II, ISAM, VSAM, Adabas, IDMS, IMS, DL11, Total
Micro: IBM-PC and 3270 look-alikes
Software: Now DOS. Soon Unix
Software to software: yes
Mainframe updates: yes

Network Systems

Kings Ride Court
Kings Ride
Ascot
Berks
Tel: Ascot 23399
Product: HYPERchannel
Mainframe: most
Software: most
Micro: most
Software: most
Software to software: yes
Mainframe updates: yes

Package Programs

91 Blackfriars Road
London SE1 8HW
Tel: 01-633 0121
Product: IFPS Interactive Financial Planning System
Mainframe: IBM, HP, Honeywell, Sperry, DEC, Prime, Wang
Harris, CDC, Data General
Software: Focus, Info, etc
Micro: IBM-PC, TI, Sierra, etc
Software: IFPS/Personal
Software to software: yes
Mainframe updates: yes

Wang (UK)

Wang House
661 London Road
Isleworth
Middx TW7 4EH
Tel: 01-560 4151
Product: Wang VS & PC
Mainframe: Wang VS
Software: Wang DMS and Document DBs
Micro: Wang Professional Computer
Software: Wang core software
Software to software: no
Mainframe updates: yes

Zynar

122/3 High Street
Uxbridge
Middlesex UB8 1JT
Tel: (0895) 59831
Product: Plan 2000, 3000, 4000 LANs
Mainframe: IBM
Software: most
Micro: IBM-PC and Apple
Software to software: no
Mainframe updates: yes



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Name

Position

Company

Address

Telephone

Mainframe Type/Model

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City

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Day

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Life emerges from the Silicon Fen

Peterborough is rapidly becoming a high tech town. Nuala Moran went there to see why it is such fertile ground for computer firms

WE'VE all heard of Silicon Valley, and lately of Silicon Glen. The latest contender in the silicon stakes is Silicon Fen - otherwise known as Peterborough.

This appellation was coined by the managing director of one of the companies which started life in the area. A look at what's happening in the computer industry does seem to indicate that Peterborough is approaching that "critical mass" situation, where companies get drawn into the town because other companies are there and people are interacting to spawn new ideas and new companies.

But it's still a long way from the stage where everybody who's anybody has to be there.

In a sense Peterborough has grown of necessity. It was designated a new town in 1967 and the Peterborough Development Corporation was set up in 1968 with the brief to expand the town's population from 81,000 to 147,000.

This has done by developing the infrastructure. The corporation provided houses, offices, factories, schools, roads and leisure

The number of jobs has gone up during a time when many parts have seen unemployment rise

activities. And it went out and persuaded companies to move into the area.

There are a lot of statistics to illustrate exactly what the corporation has done. Perhaps the most telling is that the number of jobs in the town has gone from 45,500 in 1967 to 67,650 now, during a time when many parts of the country have seen unemployment rise and

This begins to make it sound as if there was no life before the Peterborough Development Corporation. In fact Peterborough already boasted two significant computer companies, Peterborough Software and Geest Computer Services.

It also had several large engineering firms which have been transformed by the application of computer technology. One of them, Baker Perkins, has a Department of Trade and Industry-sponsored CAD/CAM awareness centre and another has indirectly spawned a recent high tech start up.

The development corporation takes credit for enticing some big computer users into the area. Large installations include those at the British Sugar Corporation, Thomas Cook, the Prudential Savings Bank, Pearl Assurance, and the latest "acquisition", Lloyds Life Assurance.

Explaining its choice of Peterborough, David Whitney, Lloyds Life Assurance management services manager, says: "We've looked at moving from the City a number of times and realised it was likely to be desirable at some stage purely for cost reasons. When the decision was finally made, we gave instructions to agents that we wanted to relocate within a certain distance of London and set the costs we were prepared to pay."

It turned out that Peterborough had the right office at the right price. At the level of taking the decision on where to go, we were just looking at Birmingham like cost. Having made the decision, we do realise that Peterborough provides an attractive home area for the computer staff moving out of London.

rough has other attractions.

"For instance, an advert in the local paper for computer staff brought in 200 replies. From this we will offer nine or 10 jobs, which is a fantastic return on one ad."

"And we found that most of our senior people are prepared to relocate." There will be about 200 staff to start off, but there is space for about 380.

"Moving to Peterborough," Whitney continues, "probably won't save us that much on computer staff salaries, but it certainly will on clerical staff. If we'd just moved to the edge of London, we wouldn't have made those savings on salaries, and the M4 corridor is too expensive for offices."

"Other areas in the South-east are very expensive for housing, so it would have been difficult to get our staff to move."

It has not always been as easy to

get computer staff to go to Peterborough. When Thomas Cook went there in 1975 it lost all

'If we'd just moved to the edge of London, we wouldn't have made those savings on salaries'

but two of its 30 or so data processing staff.

Things have changed since then. Derek Warren, manager of computer services at Thomas Cook, says: "We never seem to have any problems in getting computer staff. As a company we are involved in some of the more exciting DP developments and I think our business draws well, because travel is an exciting industry."

It has not always been as easy to

"But having said that, the facilities in the town do make it easier for us." Thomas Cook has about 120 DP staff.

"The growing number of installations in Peterborough means there is quite a good labour pool, though it works both ways, because we lose people as well. But I think it's good that other companies are coming in; it's healthy for us all."

"Our staff turnover has never gone up unduly, but it would be wrong if there wasn't a turnover."

Warren is himself a proof of the Silicon Fen argument. He is part of the "old guard" of the Peterborough computer industry. He was born and bred in Peterborough and moved into the travel business when Thomas Cook moved into the town. Before that he was with one of the established Peterborough computing concerns, Geest



WAINWRIGHT... "The hype is being checked."

Computer Services.

Geest originally set up in nearby Spalding in 1966 to do data processing for the Geest company, which at that stage was best known for bulbs and bananas. Geest recognised the market for bureau services and set up its computing arm as a separate division.

The company moved to Peterborough in 1972 for two reasons. Director Les O'Reilly

says: "Most of our customers were in Peterborough anyway and the Peterborough Development Corporation underway we found a growth in the market."

While Peterborough did turn out to be a good area for business, the growth aspect worked both ways. "Whenever a new company comes to the area, you get a tremendous ripple. This is because it is new and can offer London rates. I suppose most firms in the area suffer from rippling effects," says O'Reilly.

"We have lost some staff, but we have also come to accept that this will happen."

"On the other hand, the type of people we employ at Geest need to have wide experience, so new companies bringing new people into the area can also work to our advantage."

Geest is now furthering the development of Peterborough's computer segment with a move to micros. The company is opening a business micro retail store in the town later this month.

The shop is the brainchild of Philip Wainwright, managing director of Geest. "There isn't a micro shop for business users anywhere in the area, so I think the market is there," he says.

"For the past two to three years people have been talking about micros as if they will satisfy every business need, they've been oversold tremendously. The reason why it now seems to be a good time to get into micros is that there's some sense coming back to the marketplace and the hype is being checked."

"Everyone is realising that although the hardware is cheap, you do have to consider maintenance and training and such like things. That's the area Geest will go for, we won't necessarily be the cheapest in the market."

Wainwright emphasises that going into micros doesn't mean Geest is deserting the bureau business. "Really the main aim is to sell micros to link back to the bureau and use the shop as a way of getting business."

In fact, we've been selling standalone micros since last year and we've sold 70-80 from our existing office. But it's not ideal, because we qualify our customers

While older companies may eschew the Peterborough effect, some of the new ones are enthusiastic

by the problem they have finding us.

Having a town centre site should mean that customers just drop in. "After all," says Wainwright, "two or three visits from a salesman and you've practically wiped out any profits you might have made."

"I think the shop will be a focus for computing supplies for 30-40 miles radius, and there are 20,000 businesses in that area."

Continued opposite

Peterborough pulls in the businesses

From page 30

There is one computer company to the town that goes back further than Geest Computer Services, one where Wainwright himself worked in its early days. Peterborough Software has been around for about 20 years and, as managing director John Mills points out,

player and we're now recruiting at graduate level on a national basis. The sort of skills we're after are scarce, but people come to work here because of the type of job we offer, not because of Peterborough."

While the older and more established companies may eschew the Peterborough effect, some of the new ones are frankly enthusiastic about it. One company that demonstrates how things can rub off is Tourism Technology Limited.

This software house, which caters for the travel trade, was set up at the end of 1982 by Dave Adams, who before that spent 20 years working for Thomas Cook. He moved to Peterborough when Thomas Cook relocated there.

Tourism Technology was set up to develop Modules, an office management system for travel agents. "My immediate thought when I was asked to do it was to go back to London because the various parties involved were based there. But the choice was up to me and I decided Peterborough would be cheaper."

Adams started off in two rooms to an office block built by the Peterborough Development Corporation and has expanded to five. The original staff complement was three and this is expected to reach nine by April.

Integrated Vision is another of the companies which have started up in the area, set up by someone from another Peterborough firm.

The company is selling a two-dimensional draughting system based on the Sage 4 micro. It does turnkey systems and is happy just to sell the software, which it is continuing to embellish.

Mike O'Brien, managing director of Integrated Vision, says: "I'd just been made redundant by Perkins Diesel and was looking for a new opportunity when I heard about the system, which was being developed at Teeside Polytechnic. I went to look at it and liked it, but

The building will be exclusive, in a nice area, but only five minutes from the town. The premises will show us as a significant force in our industry. They will also provide a better environment for us to work in."

Mills does not think that Peterborough's new town status has contributed to the success of its namesake. "We've grown because of growth in the computer industry, not because of the Peterborough Development Corporation. There's no factor in our success which I would attribute to being in Peterborough."

"Peterborough Software is in one of the industries that doesn't rely on massive capital expenditure. We could be anywhere with good roads and telecommunications. We would have done the same amount of business no matter where we were."

"The development corporation's main achievement is that it has changed the profile of the town. Because it has brought in middle management people, it has increased spending power and generated a demand for services."

"This has no effect on Peterborough Software because 99% of our business is outside the town."

Another of the established companies in the town does not see the corporation as a factor in its fortunes. Baker Perkins is part of the backbone of the traditional engineering industry in the town. It has made a successful transition from mechanical to electronic engineering in its business of designing and manufacturing printing presses and process equipment for the bakery and confectionery industries.

Sally Holmes, Baker Perkins personnel manager, says: "We've changed from being a local em-

Germany and recognised that the UK market in local area networks was just about to take off."

"I came to Peterborough because I didn't have that much money and I was stumped at the cheapness of houses," he says.

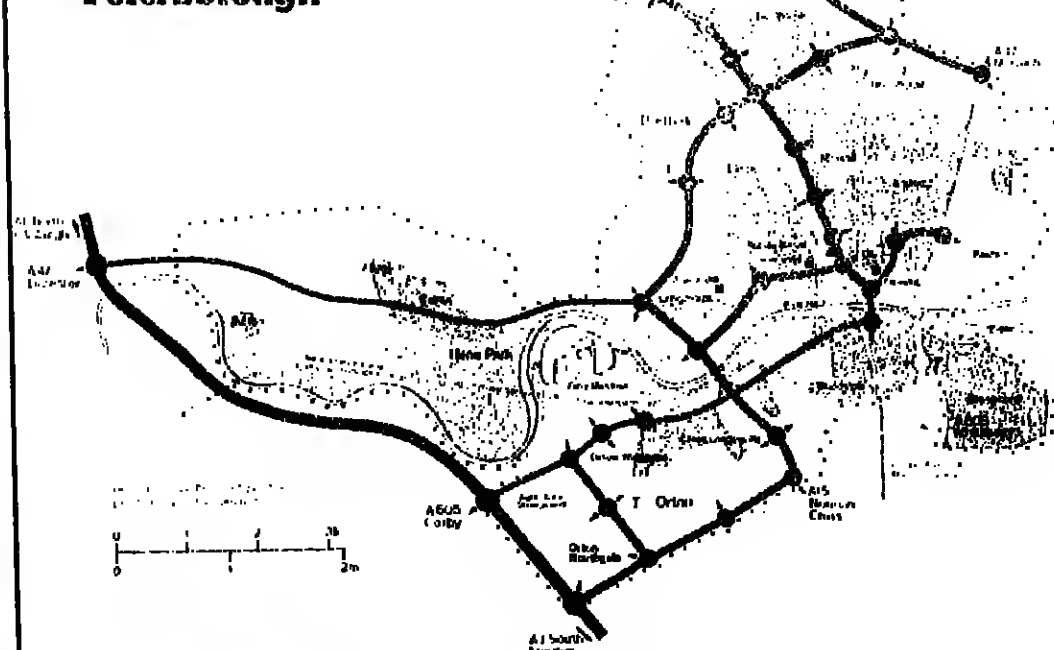
"We're now moving into manufacturing, and our first product, an advanced broadband modem for point-to-point applications, will be available soon from Network Technology, the distributor."

"We've subcontracted the making of the boards to a local firm. There was no choice of subcontractor as there would have been in the M4 corridor, but then it was half the price."

There is now quite a mix of different computer companies and users in Peterborough.

The industry in the area is big enough to spark off ideas and support new ventures. On the other hand, it has not got so big that the informal networks fall over. And some of the small firms starting up in the area demonstrate the importance of this synergy.

Peterborough



Map of Peterborough: the Silicon Fen.

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11/23-HC	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-HD	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-HE	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-HF	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-HG	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-HI	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-HJ	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-HK	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-HL	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-HM	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-HN	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-HO	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-HP	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-HQ	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-HR	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-HS	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-HT	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-HU	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-HV	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-HW	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-HX	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-HY	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-HZ	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-IA	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-IB	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-IC	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-ID	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-IE	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-IF	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-IG	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-IH	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-II	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-IL	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-IM	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-IN	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-IO	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-IP	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-IQ	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-IR	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-IS	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-IT	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-IU	DT07-BS	KD11-BA	LA120-BA	RV101/2	VT100-AB
11/23-IV	DT07-BS	KD11-BA	LA120-BA	RV101/2	

PRODUCTS



The FX15 workstation.

Workstation of Future

IN a move to grab 10% of the workstation market Future Computers announces its new FX15 which has the same specification as the 16-bit FX20 microcomputer but with one floppy disc drive.

A terminal with its own disc drive means the terminal user can have local storage on its 5 1/4 in. floppy at a low cost while using the storage in the FX30 for its main workload.

The Future range is designed and built in Britain.

Future Computers (CW), PO Box 306, Purley, Surrey. Tel: 01-683 0111.

Multiplexer options cut comms costs

RACAL-MILGO announces two major enhancements to the Omnium range of statistical multiplexers with the addition of a dual aggregate option and two integral modems.

The dual aggregate option provides two instead of one aggregate data streams at a cost substantially less than that of two separate multiplexers, says Racal-Milgo. Equipped with the dual aggregate option, the Omnium 320, for example, is now capable of concentrating 32 channels into two aggregate data streams at speeds from 1200 to 9600 bit/s.

Users have the choice of three operating modes. In load sharing configuration, an Omnium link equipped with dual aggregate will optimise user response time by transmitting data over the less loaded of the two lines. Should one of the links fail, all traffic is auto-

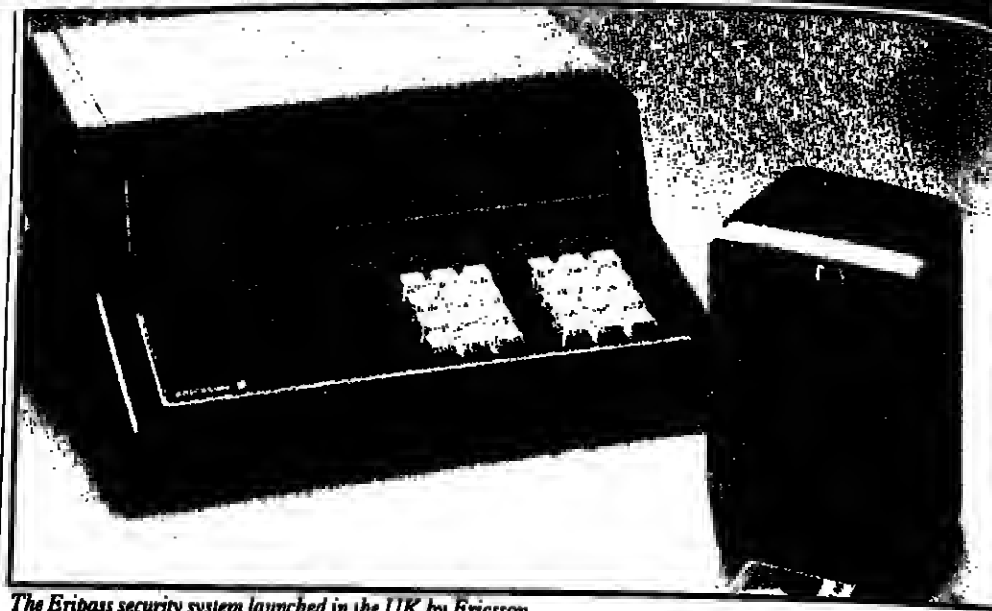
matically switched to the remaining link. When the line is restored, normal load sharing is automatically resumed.

In split link configuration, one central site Omnium fitted with the dual aggregate option can support two remote multiplexers, providing a saving in cost and space. Further saving is possible should it be necessary for the two remote sites to communicate with each other.

In split link mode, the remote modems are able to communicate with each other via the dual aggregate central site Omnium.

Two integral modems are available, giving the user a choice of 2,400 and 4,800 bit/s transmission speeds.

Racal-Milgo (CW), Landata House, Station Road, Hook, Hants RG27 9JF. Tel: (0734) 782158.



The Ericsson security system launched in the UK by Ericsson.

Ericsson joins UK security market

WITH the launch of a new access control system, Ericsson Information Systems has entered the UK security market.

Its new Eripass system comprises two basic hardware units, a combined card reader and keypad operated door lock terminal and a central control unit.

The card reading terminal is self-contained, and uses a unique

encryption algorithm to validate a personal identification number entered on the keypad against a magnetically encoded card number. It does this without reference to a computer based master list, and is fast in operation and secure against electronic or physical vandalism.

In addition, each terminal can be programmed for up to four different security levels at different

times of the day, says Ericsson.

When used as a total site security system, up to 32 terminals can be connected by means of twisted pair wiring to a single Eripass central control unit. The latter can be programmed to define up to 32 different authorisation levels.

Ericsson Information Systems (CW), 7 Gresham Street, London EC2V 7BX. Tel: 01-606 0425.

System designed for first-time users

COMPUTER Systems and Products has launched a complete computer system - hardware and software - for small businesses. Known as Micas, it is based on the new Digital Equipment Co. MicroVAX-11 and costs from £9,950.

Micas - Micro Integrated Commercial Accounting System - provides first-time users and accountants in small businesses with a ledger and management information system.

It enables users to monitor the processing of sale, purchase and nominal transactions from the input of an invoice, credit note, etc to the production of a full trial balance and comprehensive month end management reports.

The base Micas system provides a set of fully integrated software modules starting with sales ledger,

purchase ledger, and nominal ledger, each of which can be operated independently of the other two. The system also provides a wide range of monthly management accounts including budget comparisons and numerous management reports.

The system can be expanded to handle a much wider range of functions with modules already available to cover sales order processing, payroll, etc.

Due to the modular design and the system's ability to operate modules independently, users can phase the implementation of Micas by purchasing each module separately or in conjunction with either of, or both of, the other two.

Computer Systems and Products (CW), Barnsford House, Goldsmith Street, Nottingham NG1 5JY. Tel: (0602) 415155.



Micas, designed for first-time users.

UK colour terminal

MICROCOLOUR Graphics has launched a colour terminal, the M2080, at an end user price of £995. This VT100 and VT131 compatible terminal is of British manufacture and competes with mono terminals which commonly fall in the price bracket of £750-£1,000.

The M2080 offers 40 and 80 column options and is also fully upwards compatible. Full modem control is a standard feature and a range of printers can be supported.

Microcolour Graphics (CW), Future Way, Belling Road, Bradford BD4 7TU. Tel: (0274) 727274.

Winchester controller

A WINCHESTER disc controller is now available from Dilog distributors for use with DEC LSI-11 microcomputers.

The Model DO634 provides RLOI emulation for RT-11, RSX-11, RSTS, Unix or other LSI-11 operating systems. Features built into this dedicated controller include 22-bit addressing for two-megabyte access, and enhanced 32-bit ECC with a 32-bit checksum to prevent data errors.

Dilog International (CW), Temple Square, Aylesbury, Bucks HP20 2QL. Tel: (0494) 84101.

PRODUCTS



A terminal for telex rooms, featuring automatic transfer of typescript to telex message.

From typescript to telex

A TERMINAL for telex rooms featuring automatic transfer of typescript to telex message has been developed by AEG-Telefunken. It consists of a typesheet reader, a VDU-terminal with keyboard and a tape puncher.

In the past, text was typed on a typewriter and delivered on standard forms to the usually centralised telex room. There they would be retyped to generate a punched tape, which was then sent out without idling periods. With the new terminal the time-consuming process of punching tape can be

cut to a few seconds.

As usual the texts may be typed on red forms, which may include further data at the margin or head like cost item, author, copies to, signature, etc. These data, not part of the actual text, as well as corrections, are typed in red. This colour is 'ignored' by the typesheet reader.

The telex head may also be typed in black. In this case the sheet reader is adjusted so that it will start reading only at a certain distance from the upper sheet rim, ignoring the heading part. When

the typescript form is inserted into the reader, the telex text is read within 20 seconds and displayed on the VDU by pressing a key.

Now corrections may be inserted, but special characters like %, \$, as well as Unterlauts are automatically transcribed into normal lettering. If this causes excess of characters in one line, the text overflow is automatically transposed to the next line.

AEG-Telefunken, Offenbacherstrasse 1, D-6060 Frankfurt 70. Tel: (0611) 600-3574.

Lamp sheds light on life insurance

INSURANCE salespeople, it is claimed, can provide accurate and detailed quotations in minutes to clients requiring life insurance with a portable computer package developed by The Business House.

In consultation with Abbey Life, The Business House developed LAMP (Life Assurance Marketing Program) specifically for the Abbey Life sales team and its products, all details of which have been programmed into the system.

The system is based on the Epson HX-20 which has its own screen, printer, micro-cassette and keyboard and a battery life of 50 hours before it needs recharging. The Business House has packaged the system into a leather briefcase.

Now Abbey Life salesmen can show a client how much he needs to be insured for and how much it will cost. At the same time LAMP calculates the cash-in value of any policy for every single year until its maturity and illustrates this to a client by a printout.

Previously insurance salesmen used a rate book, and while this new system does not replace the rate book it offers a more reliable and sophisticated alternative to thumbing through a book to quote



LAMP system from The Business House.

their clients. When I approached Abbey Life's marketing people they were of the same mind. We have worked together to produce a major breakthrough."

Said Ray Blackman, partner of The Business House: "Coming from a sales background, I saw the Epson HX-20 as a shining light with tremendous potential for giving support to field personnel and

The Business House (CW), 47 The Promenade, Cheltenham, Gloucestershire GL50 1PJ. Tel: (0242) 517955.

Boost for telex users

HERMES' Top-tronic models 21, Super 40 and 51 can now be equipped with an interface allowing them to be coupled to a telephone modem or acoustic coupler for rapid text and data transmission between similar machines.

An advantage for existing telex users is that these models can be linked to a telex punch.

Alpha gives an Encore

THE portable Encore 200 from Alpha Datasystems now has the ability to provide network information in many different protocols such as X.25, SLDC/SNA, bitync, etc, and will operate at speeds up to 64 kps. This network analysis capability provides real time screen display of information such as response time, line utilisation, message types and error performance.

The ability to operate in a multi-drop environment and produce separate statistics for each device

on the network are standard on the Encore, as is its ability to produce full printouts of management reports or download the information to another computer for further analysis or storage.

Other recent enhancements to the Encore include capabilities to work with X.21 networks such as kilostream or other digital data networks.

Apple adds value to its range

APPLE Computer (UK) has introduced five specially packaged systems based around its IIe and III personal computers. The system range from an Apple IIe 64K starter system, priced at £1,199 up to an Apple III Profile System priced at £3,495.

Apple also announces that it will be distributing the MicroSci 572K drive as the preferred back-up system to the Apple ProFile hard-disc unit.

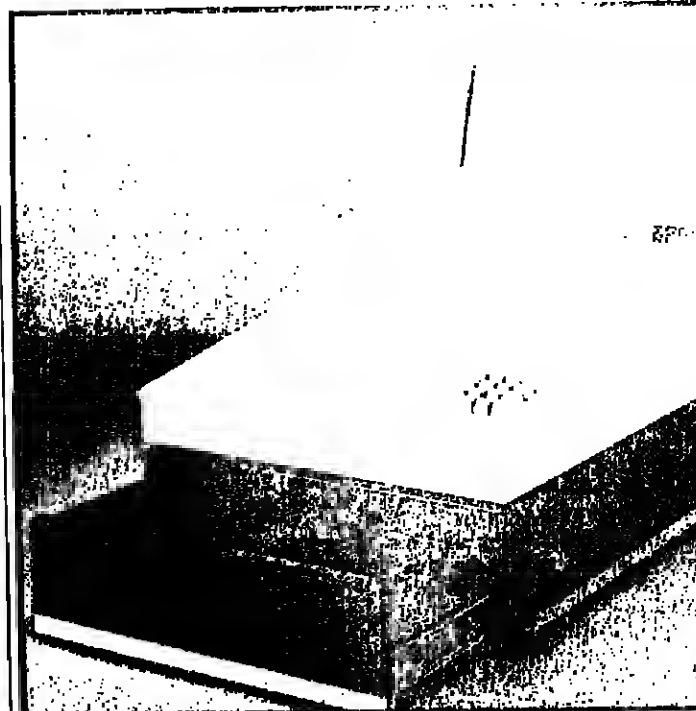
The starter system includes a 64K Apple IIe processor and keyboard, one disc drive with controller, the new Monitor II and an 80 column card. This system would normally retail at £1,419 so represents a substantial saving.

The 128K small business system has been designed to provide a more powerful alternative to the starter system. It includes the Apple IIe, two disc drives with controller, Monitor II and a dot matrix printer. Also included is an 80 column extender card. The price of £1,970 is again a substantial saving on the normal recommended retail price of £2,288.

Three specially packaged systems have been introduced for the 256K Apple III. In addition to the £2,345 basic Apple III system, which includes an Apple III, Monitor III, and System (SOS) with Apple III Emulation, Apple has designed two further specialised packages for business management.

The Apple III Word Processing System which includes Apple Writer III and a letter quality printer as part of the package costs £3,495.

Apple Computer (UK) (CW), Eastman Way, Hemel Hempstead. Tel: (0442) 60244.



Combining the functions of a cash register with a terminal.

Cash register acts as a terminal

DTI's latest emulation terminal combines the functions of a standard cash register with those of a terminal interfacing with a host computer.

To the operator and the customer, the DTI cash terminal acts as a standard cash till recording details of sales made, the cost of sales, the payment made, the change given and the issue of a receipt.

At the same time the terminal is giving this information to the host computer so both stock records and sales records are updated as a

sale is made. On a number of occasions over the last year DTI says it has been asked for terminals for point-of-sale operations, and it has been obvious that while simple terminals are required, a standard terminal is not only confusing to the operator but impractical for point of sale operation.

With this in mind DTI designed a cash terminal which incorporates the DTI Emulator logic board.

DTI Europe (CW), 10 Cronio Court, Corby, Northants, NN18 8AV. Tel: (0536) 201152.

16 colours available at once

GENISCO Computers' G-2050 interactive graphics controller is a low-cost, colour raster, graphics system capable of operating with a variety of standard high resolution monitors.

The G-2050 has a viewable resolution of 1024 by 792 pixels, with a 60Hz frame rate. Sixteen colours are simultaneously available from a total palette of 4096 hues.

Communications with a host computer can take place with a standard RS232 (to 38.4K baud) or high-speed RS422 (to 100K baud) serial link. The G-2050 operates with a keyboard, joystick, mouse, graph tablet and colour or monochrome hard copy device.

The G-2050 uses a structured system design and VLSI devices to achieve a level of performance previously available only in more complex graphics systems, says Genisco. The single board intelligent graphics module has two processors, a 16-bit supervisor microprocessor, and dual graphics display controllers.

Additional circuitry includes four planes of refresh memory (each 1024 x 1024 bits), three intelligent communication controller



The Genisco G2050.

ICs, video look-up tables and digital to analogue converters for red, green and blue outputs, as well as the control logic necessary to integrate the whole system.

The hardware design produces such features as the Integer zoom, colour control, memory plane gain and overlay selection. The Tektronix 4014 code-compatible operating system resides in 32 Kbytes of on-board EPROM. Other graphics commands are included which allow full use of the powerful hardware features.

Genisco Computers (CW), 7 Notre Dame Mews, Northampton NN1 2BG. Tel: (0604) 24621.

Direct digital switching for Harris' D1200 family

HARRIS Digital Telephone Systems has launched a direct digital data switching facility for its D1200 family of 100 to 1000 line PABXs. The cost is under £500 per line.

Using a two-pair interface, direct data transmissions are made possible between the D1200 PABX and computers, terminals, peripherals as well as other PABX lines, without using modems. Users enter the desired extension number via the terminal keyboard, and data is transmitted from port to port in digital format and with automatic baud rate selection between 110 and 9600 bits per second.

The new feature, says Harris, will provide users with a cost-effective solution to the problem of inter-office switching of PABX lines and for interconnection with existing computer installations, DDP, PC and WP terminals, as well as with local area networks for combined voice and data transmission.

The data transmission capability makes use of a line driver box - free standing or rack mounted - but located near each terminal. This unit extends the transmission distance up to 4,000 feet, well exceeding the standard RS232 cable limit of 50 feet. The interface between the driver and the Harris D1200 requires only a two-pair line with no special system wiring.

Data cards in the PABX occupy two time-slots and accommodate up to four devices each. All "calling protocols", including confirmations and line-busy screen messages, are handled automatically by the system. Request "calls" are directly keyed.

Harris Digital Telephone Systems Division, 153 Farnham Road, Slough, Berks. Tel: (0753) 34666.



The Encore 200 portable network analyser.

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New range of disc sub-systems announced

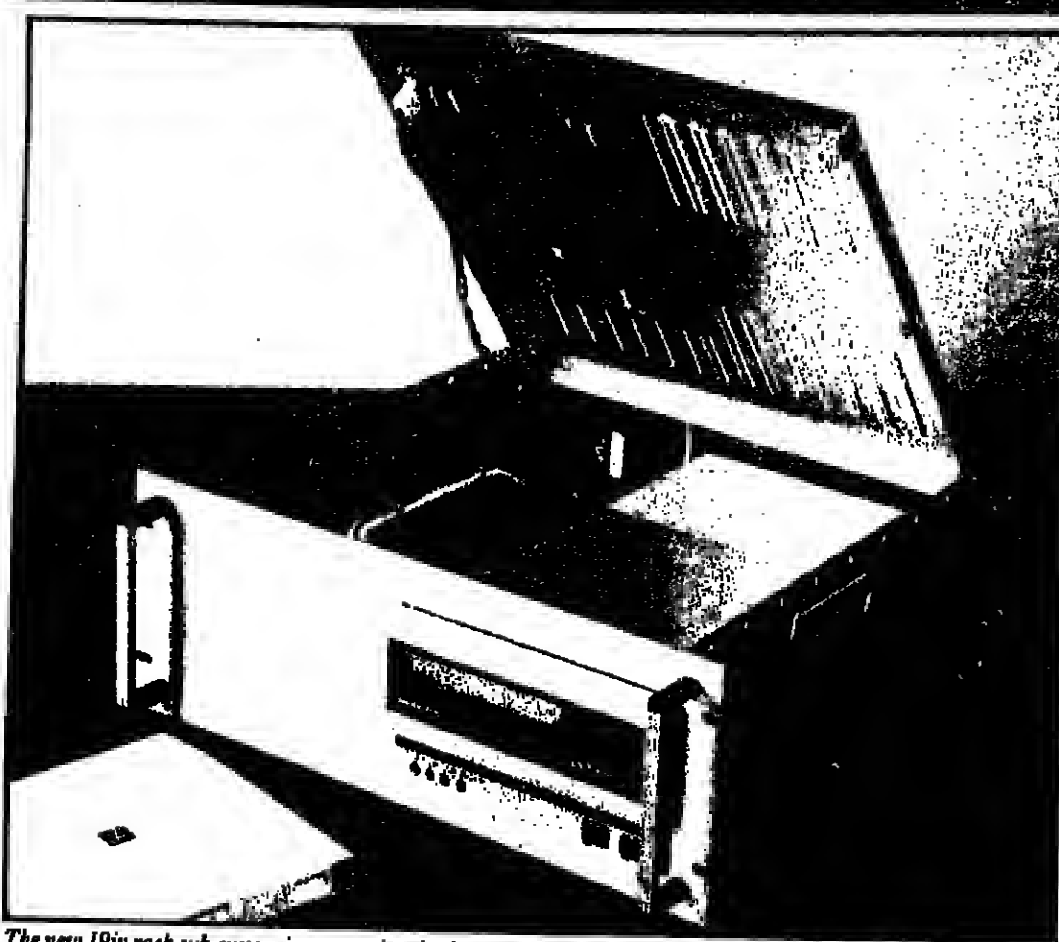
QUEST International Computer Equipment has developed a new range of disc sub-systems, for use with leading mini and microcomputer systems. The 19in. rack sub-system is based on the Aircodyne Arapahoe 7110 disc drive, which is also available as a single unit for OEMs and end users.

The Arapahoe is an 8in. drive providing 53.2 Mbytes of formatted storage capacity, with a combination of 26.6 Mbytes fixed and 26.6 Mbytes on a removable ANSI standard cartridge. It has a 30ms average access time.

The drive incorporates Whitney technology, which features advanced head suspension and read/write technologies derived from the new generation of main-frame disc drives.

A microprocessor-controlled embedded servo system ensures maximum head to disc alignment.

Quest International Computers (CW), School Lane, Chandler's Ford, Hampshire SO5 3YY. Tel: (04215) 66321.



The new 19in rack sub-system incorporating the Arapahoe 7110 disc drive from Quest International.



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For full information pack, please contact:
Fujitsu Micro Computer Systems, Fujitsu Mikroteletronik, 1 Curfew Yard, Thames Street, Windsor, Berks SL4 1BN. Tel: 07545 50551

FUJITSU MICRO COMPUTER SYSTEMS



A manager to keep track of phone bills

MORE precise control over business telephone usage and costs is now available with TeleManager One, a new concept in telephone call accounting for switchboards of 30 to 500 lines from Intercom Communications Systems.

TeleManager One is a third generation system which gives instantly, upon demand and on site, what are claimed to be the clearest management reports available in its price range.

It plugs directly into the switchboard. Call information is processed to give both a detailed overall picture of telephone costs, and individual analyses.

Reports can identify volume, duration and costs of calls, and also highlight problem areas such as phone abuse or overuse. They can summarise costs by department, extension or number called.

Analyses can also point out ways to improve a telephone network's efficiency, for example whether more or fewer extensions or a private circuit are advisable.

TeleManager One can achieve annual savings of up to 30% in the telephone bill, through better network planning and a reduction in dialled units, says Intercom.

A client billing facility enables users to allocate telephone costs precisely to specific jobs, cost centres or customers. The system can



TeleManager One.

Printer with graphics

MICRO-LITE 80 is a serial impact dot matrix printer designed for the microcomputer market, offered at a lower price than the present industry standard.

Operating at 80cps (text mode), Longi Micro-Lite 80 features a full 96 ASCII character set including semi-graphic and international characters, graphics capability and adjustable sprocket and

friction paper feed. All operations can be modified under software control and the printer can be interfaced to most leading makes of microcomputer.

Micro-Lite 80 weighs 5.3kg with dimensions of 377mm x 295mm x 125mm high.

Longi (CW), Hasworth Lane Trading Estate, Chertsey, Surrey KT16 9LZ. Tel: (09328) 61241.



The Micro-Lite with graphics capability.

PC transfer package

AN application software package allowing users of Ultimate computers to emulate an IBM-PC, transferring files between each, is available from Universal Computers Ltd (UCL), at £420 (or £10 a month rental). The package, SmartTerm/PC, can be used on both Ultimate Honeywell-based machines and DEC-based equipment.

SmartTerm/PC runs on the IBM-PC and operates in conjunction with the standard IBM asynchronous communication adapter, allowing the personal computer to emulate a DEC VT100 terminal. The PC will then be able to communicate with the Ultimate computer, running the Ultimate operating system via standard asynchronous protocol.

The disc drive version of the ScreenSystem incorporates Mail Merge, which allows variable information, such as names and addresses from one file, to be automatically merged with information contained in another file.

Daro Typewriters (UK) (CW), Ltd International House, Old Station House, Leighton, Essex. Tel: 01-562 9115.

Daro adds a disc drive

DARO Typewriters (UK) has added a further option to its Serd 2000 electronic typewriter. It now offers a full off-line text editing disc drive method of storage and display which incorporates 160K 5 1/4in. diskettes.

The Serd ScreenSystem disc drive is available with either single or twin disc drive software and can be added to any existing ScreenSystem which has 32K+ memory. It can also be added to most Adler, Imperial or Triumph electronic typewriters.

The disc drive version of the ScreenSystem incorporates Mail Merge, which allows variable information, such as names and addresses from one file, to be automatically merged with information contained in another file.

Daro Typewriters (UK) (CW), Ltd International House, Old Station House, Leighton, Essex. Tel: 01-562 9115.

APPOINTMENTS

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Senior Analyst/Programmer (IBM MVS/JES ASSEMBLER)

London & Berkshire to £17,000

Control Data is a major manufacturer and supplier of computers and peripherals. Its U.K. subsidiary, Control Data Ltd, employing over 4000 people, has its main activities in the areas of manufacturing, supplying services, and marketing the full range of computer products to institutions of national scientific importance.

As a member of a team whose mandate includes marketing support and installation of full scale systems, your principal role will be to support the linkage between Control Data Supercomputers and IBM MVS/JES3 mainframes. This will include the support of existing customers, software enhancements and the development and presentation of proposals to prospective customers.

Ideally qualified to degree level, applicants should have experience in the following:

- * ASSEMBLER and high level languages
- * IBM MVS/JES2 or JES3
- * Network protocols (an advantage)

A high degree of self-motivation and the ability to work to strict deadlines is essential. An initial training course of three months will be given in Minnesota, U.S.A.

A large proportion of your time will be spent at customer installations and therefore UK and occasional overseas travel will be necessary. Depending on experience a company car may be provided.

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- * Financial applications
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Greenwich Building Society retains a competitive and innovative position in the market place and is soundly based with assets of £70 million. The Head Office is located at Greenwich with a number of branch offices based in S.E. London, Kent and Essex.

The Data Processing department comprises two ICL System 25's (one dedicated to program development) with remote communications supporting sixteen VDU stations and eight printers on-line.

The Data Processing Manager will take responsibility for the day to day running of the department and the management of three Computer Operators. There are a variety of interesting developments planned and these include COM, BACS, an Investment Portfolio system and a Mortgage Application system.

In addition, the successful candidate will maintain and enhance existing software. Applicants should be able to demonstrate management skills with ASSEMBLER programming experience gained on System 10 or System 25 hardware.

Excellent career prospects will be presented to the right person together with the following benefits:

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- * Relocation assistance

For further information, contact Knight on 01-491 4706 quoting Ref TD 200.



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Unilever Computer Services is a leading computer service company providing a full range of software house and computing facilities covering a variety of application, language and hardware environments.

An Analyst/Programmer is required to undertake a long term assignment at a client installation, initially based in London but later in South Essex. The individual will be a member of a project team developing an Integrated Production and Management Control System for this major manufacturing company.

The system under development will be based on a DEC VAX 750 configuration operating under VMS with the main application programs written using COBOL.

The applicants should therefore have some programming experience with a minimum of 2 years COBOL, preferably gained in a DEC VAX environment. Fortran experience would be an added asset.

The career opportunities within Unilever Computer Services Limited are excellent and the successful candidate can expect an interesting and stimulating future.

Find out more - contact Knight on 01-491 4706 quoting ref YV101.



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A high technology manufacturing environment needs to be complemented by advanced Data Processing services. Our client is currently engaged in the development of systems to provide advanced information services for a wide range of related application areas. They operate an IBM 4341 making extensive use of CICS and DLI with VM/VSE and have established links to other IBM mainframes in the UK.

They are now seeking additional PL1 Programmers to play a major part in this challenging development area with involvement in all levels of system activity working in a project team environment.

Candidates should have at least twelve months programming experience in PL1. A knowledge of IMS, DLI or CICS is an advantage although training will be given to the successful candidates.

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Position Sought: _____

Ref no, if applicable: _____

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The news is all from Morgan-Grampian plc., a major publishing house responsible for 50 important titles, many of them required reading for people concerned with the advances of high technology in business and industry.

With the installation of a large new IBM system 38 configuration at our Head Office in Woolwich by leased line to an IBM 3083 connected at Croydon, we're now ready to take on the exceptionally bright, people-orientated Programmers who will write the synopsis for our future growth — in RPG and COBOL — and do much more besides. There will be opportunities for writing systems using micros, minicomputers and mainframe in a multi site environment.

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What we want from you

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MG

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Programmers up to £10,520

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BRITISH GAS

Head of MVS Systems Support

The Rutherford Appleton Laboratory, part of the Science and Engineering Research Council, supports scientific researchers in universities and polytechnics throughout the UK. The Computing Division provides large scale computing services and coordinates computing research programmes. There is a large IMA-compatible mainframe complex, and a large number of distributed computers.

There is a vacancy for a head of MVS support, who will take responsibility for maintenance of MVS/JES3 operating systems both on the scientific (IBM 3081 and ICL Atlas 10) and administrative (IBM 3032) systems. This will involve applying updates, solving problems, reporting bugs to the manufacturer, reconfiguring and tuning, establishing operational procedures, etc. The post is in Computer Services Group but there is no need for liaison with the users and development groups as required.

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Application forms from: Recruitment Office, Rutherford Appleton Laboratory, Science and Engineering Research Council, Chilton, Didcot, Oxon OX11 0QX. Tel: Abingdon (0235) 445435, quoting ref. VN 209.

Closing date: 5th April 1984

serc Rutherford Appleton Laboratory

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In return for your highly developed skills our client offers an attractive salary with company and departmental bonus schemes plus a range of usual big company benefits.

Our client wishes to make these appointments without delay so please write with full C.V. as soon as possible to: Mr. G. Green

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Candidates to which you do not wish your application to be forwarded should be listed in a covering letter.

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IBM Programmers

- * PL1, Fortran
- * Mark IV (an advantage)
- * Scientific applications (an advantage)

Training Instructors

- * PL1 and/or Fortran
- * VM/CMS and/or TSO/SPF

Analyst/Programmers

- To convert mainframe applications to run on a personal computer hardware.
- * PL1, MVS JCL, EXTENDED SPF, MARK IV
- * Micro networking experience (UNIX an advantage)

Systems Analysts/ Systems Programmers

- Candidates should either have a B.Sc. Engineering qualification with at least 4 years DP experience or 7 years related job experience with 2 years as an Analyst. Experience in PL1 programming is essential and ISPF is preferred with sound knowledge of some of the following:

- SP6 OS, JCL, TSO, Project Development Methodology, Parvalet Program Management, IBM Utilities, Flow Charting - Data Flow Diagrams, ISPF Dialogue Manager, Structured Programming Techniques, Documentation Writing.

The ability to liaise with users to define maintenance and development projects through to implementation with minimal supervision is essential.

Systems Analysts - Training

Training experience is PL1, Fortran, TSO/SPF, CMS in an IBM environment operating under MVS/JES2 and/or VM. In addition a sound knowledge of the oil industry and the ability to communicate effectively is essential.

Systems Analysts

Candidates should either be degree qualified with 5 years IBM DP experience or a minimum of 8 years in an IBM environment. A sound knowledge of MVS, VM, SAS, TSO/SPF, PL1 and/or Fortran is desirable. Previous experience either as an instructor or working as a member of a project team is an advantage.

Training Instructor

- * DEC/VAX experience in sufficient depth to be able to train personnel in applications.

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- * Network systems

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- * Background in Project Management

Systems Analysts - Office Systems

- * 5 years + experience in Office Systems
- * Knowledge of IBM, WANG, DEC applications
- * Recent experience in control of Office Systems particularly Word Processing, DP or micro systems

Senior Analysts - Strategic Planning

- * Experience of long range planning
- * Risk/Benefit Analysis
- * BSP
- * Mini/micro business applications (an advantage)

Technical Writers

- * Specialist in SCRIPT or VM/DCP
- * Practical working knowledge of a database installation (Model 204 a distinct advantage)

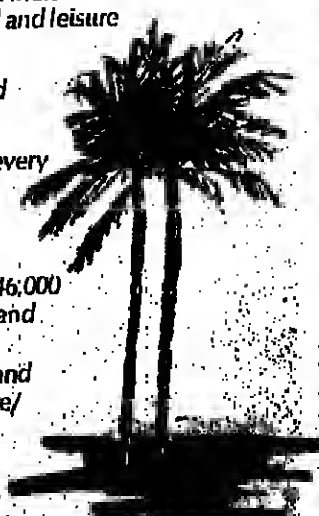
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Contract (IBM — London)

Op System	Position	Package	Language
DOS/VSE	Prog	DLI ± CICS	COBOL
DOS/MVS (Conversion)	Anal/Prog		COBOL
DOS	Prog		COBOL
MVS	Prog	IDMS	PLI
MVS	Prog	TSO/SPF	Fortran
DOS CMS	Prog	CICS/ADABAS	COBOL
MVS DOS/VSE	Prog	Detadictionary/Taliman	COBOL
MVS	Analyst (Operational)	VSAM, CICS DLI, RAC-F	Assembler
	Databse Analyst	IMS	—
OS/MVS/CMS	San Anal, Anal Prog	RAMIS, CMS, FCS, EPS	—
DOS/VSE, VM/CMS	Prog	CICS	COBOL
MVS	Prog	CICS	COBOL
DOS/VSE	Anal/Prog	CICS/DLI	PLI
DPPX	Prog	DTMS	COBOL
MVS	Anal/Prog	IMS/DB ± CICS	PLI
MVS	Anal/Prog	—	Mk IV
VM/CMS	Analyst	—	Mk IV
EDX	Anal Prog	—	Assembler
Syst 34, 36, 38	Proge (any number)	—	RPG III or COBOL
Syst 38	Systems Designer	—	RPG III
IBM PC/Apple/Micro	Anal/Prog	D Base II	Basic
IBM	Anal/Prog	Focus	—
Contract (Various London)			
ICL VME	Progs	IDMS, TPMS ± LAFIS	COBOL
ICL VME	Anal/Progs	DMS, TPMS ± LAFIS	COBOL
Datapoint	Anal/Progs, Progs		Databse
NCR 90/20/30 - IMOS 5	Anal/Progs, Progs		COBOL
Wang VS	Prog		COBOL
Honeywell 66	Prog	IDMS, TDS	COBOL
UNIVAC OS 1100	Prog	DMS 1100	COBOL



U.S.A.

Op System	Position	Package	Language	Location
IBM DOS	Anal/Prog	CICS/DLI	COBOL	San Francisco
IBM OS or MVS	Progs and Sys	CICS/DLI	PLI	San Francisco
IBM VM/CMS	Progs and Sys		—	San Francisco
IBM VM/CMS	Progs and Sys		—	San Francisco
IBM DOS	Progs and Sys		—	San Francisco
IBM OS	Progs and Sys		—	San Francisco
SEL	All levels		Any high level	U.S.A. three locations
Contracts S.E. England				
IBM DOS/VSE	Anal/Prog	COMICS	COBOL	
IBM DOS or OS	Anal/Prog	CICS ± OIL	COBOL	
IBM DOS or OS	Anal/Prog		—	
IBM DOS	Anal/Prog	MANTIS	—	
IBM OS/MVS	Test Eng	MS DB/DC	COBOL	
M8809 UNIX	Prog		Pascal	
ICL ME 29 (TME/TP)	Anal/Prog	DMS	COBOL	
Burroughs 1900	Anal/Prog		COBOL	
Contracts S.W. England				
IBM MVS	Progs	TSO/SPF	PLI	
IBM MVS	Progs	MS DB/DC	PLI	
IBM MVS	Progs	MS	PLI	
ICL GII DME	Progs	MAXIMOP, UNIPAY	COBOL	
Data Point DOS/RMS	Progs		Databse	
UNIVAC 1100 EXEC	Anal/Prog		JSP COBOL	
Contracts N.W. England				
IBM MVS	Syst/Anal	CICS	—	
IBM MVS	Systems Anal		—	
IBM MVS	Analyst		—	



Contract Software Engineers and Scientific

Op System	Position	Package	Language	Location
DEC POP 11/70	Progs		Macro II	SE England
DEC VAX 11/750	Anal Progs	Real-Time simulation	RTL2	SE England
INTEL 8086	—	Real-Time	Assembler	SE England
ICL 290B (OME/G III)	System Progs	Real-Time	Assembler	Liverpool
DEC VAX 11/750	Software Engineer	Real-Time	Any high level language	SE England
OEC RSX 11M	Progs	—	Corel 66	Kent
DEC RSX 11M	Software Engineer	—	Corel 66/RTL2/Macro II	Surrey
DEC RSX 11M	Systeme Prog	—	Fortran	Herts.
DEC VAX	Software Engineer	Mascot	Corel 66	6 locations U.K.
Motorola B800	Software Engineer	—	—	Herts.
Motorola B800	Software Engineer	Communications	Assembler	Herts.
INTEL 8088	Hardware Engineer	—	Assembler, PLM, Corel	Herts.
—	Mathematical Modeller	—	Fortran	Berke.
Z80 CPM	Software Engineer	Communications	Assembler	Herts.
INTEL 8086	Software Engineer	—	Assembler	Northants.
Micro (any)	Hardware Engineer	TTL Logic Design	—	Northants.
VAX	Progs	—	Fortran	Surrey
—	—	—	Fortran 77	Surrey
—	Technical Author	Hardware	Software	Surrey

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Permanent Client Opportunities — Call Peter or Paula

Position	Experience/Education	Hardware	O Syst	Packages	Languages	Location	Salary
Lead Development Analyst	Degree — Structure or Civil Engineering	IBM Prime	MVS	PDMS		Middlesex	16K
Analyst/Prog	Extensive knowledge MSA	IBM	DOS/VSE	VSAM	COBOL	SW London	12.5K
System Analyst	Databse + Insurance experience	IBM	DOS/VSE			Surrey	10.5K
Team Leader	Good insurance experience	IBM	DOS/VSE/VM with AP1			Surrey	13K
Operations Supervisor	Syst prog, operations, supervisory, management experience — all essential	IBM	MVS			Middlesex	17.5K
Network Supervisor	Degree — Technical involves extensive world-wide travel	IBM 4341				London	15K
Analyst/Prog for new installation	Mathematical applications	Syst 38	OS		COBOL RPG III	City	13K
Analyst/Prog	Min. 2 years experience	Syst 38			RPG III	Middlesex	12K
Software Engineer	BSc — Extensive Real-Time experience	INTEL			ASSEM PLM	Berkshire	16.5K

Permanent Client Opportunities continued

Analyst/Prog	Insurance experience	ICL	VME	OPAC	COBOL	Surrey	9.5K
Sen Analyst/Prog	Degree in numerate subject good telemetry experience essential	DEC LSI 11/23			Macro II Fortran	Sussex	14.8K
Software Engineers	Real-Time defence experience essential	DEC/VAX POP	VMS RT 11 RSX 11 M	Mascot	Pascal Microware	Cleveland Gloucestershire	15K
COBOL Prog	Demanding new development environment — provides a challenge	HP 3000			Image + View COBOL	Brighton	10K

Permanent Client Opportunities — Midlands — Call Keven

Position	Op System	Package	Hardware	Language	Location	Salary
Senior Programmer	IBM MVS/IMS	Any	IBM 3033 IBM B081	COBOL	Manchester	14K+
Analyst/Programmers		MAAPICS	IBM Syst 34RPG II IBM Syst 38RPG II IBM Syst 38RPG III		Birmingham	13K
Senior Analyst/Programmer	IBM DOS/VSE	COPICS CICS	IBM 4341	COBOL PL/1	Coventry	12K
Project Leader	IBM VMS		OEC VAX	Basic Macro	Birmingham	14K
Operations Supervisor	IBM VMS		DEC VAX	Basic	Birmingham	14K

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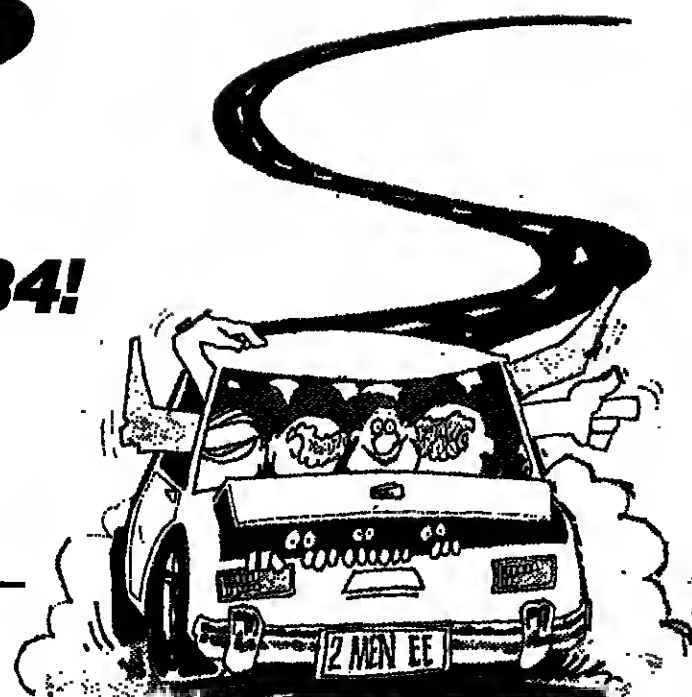
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COBOL Progs
HP3000 COBOL RAPID IMAGE Progs
HP3000 QUICK QUIZ COBOL Progs
IBM Mark IV Progs
IBM Series 1 RPS Assembler Progs
IBM 8100 DPX or DPX Progs
IBM PL1 some with JSP
IBM COBOL IMS DB/DC Progs
IBM OS MVS COBOL TSO/SPF
Analyst/Progs
IBM COBOL with Adabas Progs
IBM COBOL with any Database Progs
IBM OS MVS JES 3 System Prog
IBM OS MVS Systems Prog
IBM COBOL IMS ADF
IBM COBOL with Michael Jackson
Techniques
IBM COBOL CICS/DL1
IBM OS MVS Tech Support Prog
IBM System 38 RPG III or COBOL
IBM MANTIS Progs
ICL COBOL Progs (to be trained in
IMS/TPMS)
ICL IDMS Analyst Designers
ICL 2900 VME Systems Prog
ICL 2900 VME COBOL, some with TPS
ICL 2900 VME COBOL with Querymaster
Prog/Analyst
ICL COBOL with TOTAL Progs
ICL DDS Consultant
ICL VMEB IDMS COBOL
all levels some with TPMS
ICL VMEB IDMS Tech Support Prog
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INTEL 8086 PLM Software Engineers
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SC137

SC145

DB115

PH148

DB116

DB136

DL/CW/PH118

DB139

KC/DB/SC119

KP120

CW154

CW155

SC147

KC121

KP156

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SC148

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BT 132

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BT 136

BT 137

BT 139

BT 140

BT 141

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Risk/Benefit Analysts
Strategic Applications Planners
IBM PC Applications & Programming Specialists

BT 142

BT 143

BT 144

BT 145

BT 146

BT 147

BT 148

SOUTH AFRICA Contact: BILL TORBITT
Data General MV 4000 OS/VSE COBOL
Programmers - Family Status

BT 149

USA Contact: STEVE WHITING, SANDRA CAREY or
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IBM Mark IV Progs
IBM COBOL IMS DB/DC Progs
IBM PL1 with IMS DB/DC Progs
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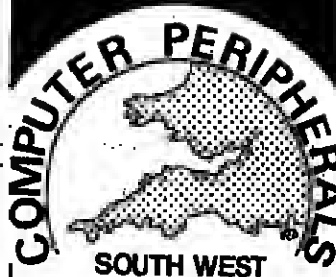
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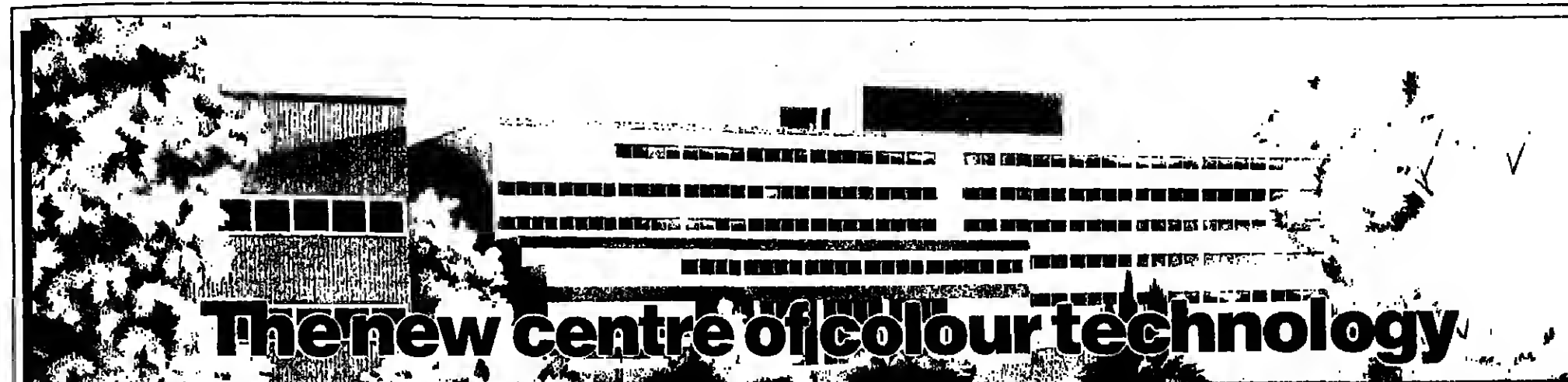
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£17.5-£20K + car

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The person we seek will have the ability to combine technical excellence, with an instinctive feel for systems work and an ability to communicate effectively with customers.

Considerable travel is involved.

Initial interviews will take place in the UK within the next two weeks. If you would like to be considered for this vacancy, please send a comprehensive CV to Joan Lovejoy at Computer Search & Selection Ltd, Hamilton House, Marlowes, Hemel Hempstead, Herts HP1 1BB, or for further information telephone 0442 40761.

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Plenty of life in Hambro

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Weinberg explains his role on Fowler inquiry and launches 'po'... WEINBERG, deputy chairman and managing director of Hambro Life, explains his role on the inquiry and launches a new concept of "portability" and "total linkage" which offers a charging structure which provides a marked improvement in the planholder's position.

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28

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Please contact JOAN AINSWORTH on 01-681 8311 or write to her at: C.S.S., 6th Floor, Carolyn House, Dingwall Road, Croydon, Surrey CR0 9XF.

Analyst/Programmer

£10-12,000

Following its planned expansion path, the DP department is now looking for an analyst/programmer of good academic background, able to be responsible for their own part of a project from start to finish.

User contact plays a large part in the day-to-day activities of the department, placing requirements over and above those of technical skills on applicants. These interpersonal skills and an alert mind are more important than particular hardware and software experience, although obviously, any previous experience in the financial sector and knowledge of BASIC+2, would be very useful. If you have 1-3 years' experience and would like to contribute to the further success of DP within the partnership, we should like to hear from you.

Computer Search & Selection Ltd

COMMERCIAL OPPORTUNITIES

PL/1 Programmers Insurance, Surrey To £11,000 p.a.

As an essential element of this company's growth plans for 1984, a number of positions have been created for PL/1 programmers to support and develop a leading Financial organisation's current projects. An IBM/DOS/VSE background is essential and SHADOW experience would be desirable, however, in house training is provided. In return the company offers a range of benefits which include flexible working hours, excellent pension scheme, subsidised staff restaurant, social and sports centres, 20 days annual holiday, and the opportunity to develop your career within a progressive company.

Systems Analyst (IBM 4343) Insurance, Surrey To £13,000 p.a.

A challenging opportunity exists for a Systems Analyst with a good knowledge of IBM online database systems to make a significant contribution to the development of a major project within this expanding DP department. The ability to liaise effectively with users is essential and in return the company offers an excellent career and benefits package which includes: free life assurance, flexi-time, video training/courses and the chance to work with the latest technology.

Analyst/Programmer Major Oil Company, W1 £8-£12,000 p.a.

A major International Oil Company based in the West End currently has vacancies for Programmers and Analysts who wish to become involved in a wide range of Commercial projects. Experience of IBM 4341 DOS VSE CMS is an essential prerequisite alongside a knowledge of CICS and DL1.

Excellent company benefits include Group BUPA, £1,800 London allowance, LVs (£500 p.a.), 4 weeks holiday, 3% contributory pension etc.

For more information about these positions call Andrew Rutherford on 01-938 1804 or write to him enclosing a career resume.

IPP Information Processing People
Specialist Recruitment Consultants
20 Kensington Church Street, London W8 4EP
Telephone 01-938 1804 Telex 22861

FINANCIAL APPLICATIONS

ANALYST/PROGRAMMERS SUPPORT CONSULTANTS

Walton-on-Thames & Stonebridge Park

SPERRY is a recognised world leader in the Computer Industry. This progressive and dynamic organisation is seeking Applications Development Analyst/Programmers and Support Consultants for a Financial Applications System.

We are looking for people who have experience in COBOL, on-line systems programming, Database or banking applications. This would be an ideal opportunity for those with approximately 5 years' commercial experience who now wish to further their career with a major manufacturer.

The Development Team is based at our offices in Walton-on-Thames, Surrey and the Support Group at our headquarters at Sperry Centre, London NW10.

Positions are available at a number of levels. We are offering starting salaries of between £9,000 and £13,000 in addition to the company benefits you would expect from a large organisation. Certain positions will include a company car as part of the package, and will necessitate international travel.

Please write enclosing your cv to Mrs. Valerie Solomon, Sperry, Sperry Centre, Stonebridge Park, London NW10 8LS.



We understand how important it is to listen.

COBOL Programmers

Croydon to £10,000

Our client is an established Management Services department, in the process of developing new systems.

If you have at least one year's practical COBOL experience, preferably gained in a VME, DME or VMS environment, these positions offer you the opportunity of initial training in appropriate areas and other training as your career develops.

- Subsidised mortgage
- Non-contributory pension
- Life assurance
- Free BUPA
- Removal assistance
- Flexible hours
- LV's

ICL 2900 DEC/VAX Micros

Please contact Joan Ainsworth on 01-681 8311 or write to her at Computer Search & Selection, Carolyn House, Dingwall Road, Croydon, Surrey CR0 9XF.

Computer Search & Selection

DEC Programmers

Surrey to £11,000

Our client, part of a major group of companies, is a young, dynamic software house looking to recruit experienced programmers, who will enjoy being part of a growing company and making their own effective contribution to its growth. Client contact is an important part of the job—which means that we are looking for able communicators who are articulate, presentable and in possession of a wide range of technical skills. These technical skills will include programming in COBOL and/or BASIC, (on commercial applications using DEC equipment) program testing and, ideally, program specification writing.

In addition to the skills you bring with you, you will subsequently acquire others—in particular on micro-computers (including SIRTUS and APRICOT). The systems you will be developing will be both batch and on-line.

To apply for these and other positions, please contact Joan Ainsworth on 01-681 8317 or write to her at Computer Search & Selection, 6th Floor, Carolyn House, Dingwall Road, Croydon, Surrey CR0 9XF.

VAX/VMS
PDP-11/RSTS
COBOL
BASIC

Computer Search & Selection

Our client is a long established British company with an enviable reputation worldwide for engineering excellence. With the production of over 100,000,000 precision components each year, they rank as a major force in the automotive world and their products are used in nearly every make of vehicle in virtually every country in the world in addition to other sectors within the industry.

With the introduction of a broad-based 5 year DP strategy, this company is dedicated to information technology which includes the latest in developments: CAFS, NETWORKS, Office Automation, CAD, etc.

Central to this, is the recruitment of a Senior Systems Analyst who will be able to draw on experience gained in the areas of Sales Order Processing, Inventory, Production Planning, etc.

The candidate's age will not be a barrier as maturity of character will be a positive asset. As this is a development position, candidates will need to demonstrate written and oral communication skills, as well as the ability to deal with users at all levels. This is a key position and will offer considerable variety and scope for personal development.

For further information and an informal discussion please contact Marshall Cligman at the London number below or in the evenings at EPPING 76085

TCR

Targa Computer Recruitment

19 Ropemaker Street London EC2Y 9AS
Monaco House Bristol Street Birmingham B5 7AS

Telephone 01-588 9871 Telex: 25851
Telephone 021-622 2045 Telex: 334237



Senior Systems Analyst

£12,000

East Berkshire
New Systems Development
Machine background irrelevant
Generous relocation assistance

RESOURCES INTERNATIONAL RESOURCES INTERNATIONAL

**CONTRACT
SELECTION****LONDON & THE SOUTH****IBM Requirements**

Business Analysts	All areas	
Analyst/Programmers	IMS, DB, DC	COBOL
Analyst/Programmers	CICS, DL-1	COBOL
Analyst/Programmers	MANTIS	COBOL
Programmer	MVS	PL-1
Programmers	MVS	FORTRAN
Analyst/Programmers	System 38	RPGIII
Analyst/Programmers	MVS	JACKSON COBOL

ICL Requirements

Designers	IDMS	
Analyst/Programmers	IDMS, TPMS	COBOL
Programmers	System 25	

Other Requirements

Analyst/Programmers	DEC, VAX-Datcomms	
Programmer	WANG	ASSEMBLER
Programmer	WANG	RPGII
Programmers	DG	COBOL
Programmer	DG, AOS	FORTRAN
Programmers	UNIVAC 1100, DMS	ASSEMBLER
Programmers	UNIX	COBOL
Programmers	Micro	COBOL
Programmer	GSX	RM COBOL
Analyst/Programmer	FOCAS	Basic FORTRAN

MIDLANDS & THE NORTH**IBM Requirements**

Business Analysts	Purchasing and/or costing	
Programmer	System 38 MAPICS	RPGIII
Analyst/Programmers	DOS, CICS, DL-1	PL-1

ICL Requirements

Analysts	ME29, TME, RAPID	
Analyst/Programmers	ME29, TME, RAPID	COBOL

Other Requirements

Analyst/Programmers		CORAL
Programmer	APPLE, CPM	DBASE2
Programmers		RTL2
Database Administrator	UNIVAC 1100, DMS	
Programmers	UNIVAC 1100	COBOL

**PERMANENT
SELECTION****Anal/Progs City to £16,000 + mortgage subsidy**

Three of our banking clients are seeking applicants with System 38 RPG III backgrounds along with a minimum of two years' banking experience, for involvement on a large range of development projects. These are excellent opportunities. Solid 34 people will be considered.

Programmers W.3. to £10,000

A minimum of 18 months' experience is required in an IBM installation plus a solid COBOL or ASSEMBLER background for the opportunity to work in this progressive environment on a large variety of development projects. Very good career advancement.

Consultants & Sen Anal/Progs S.E.1. to £15,000+perks

Our client is seeking candidates for a number of senior positions ranging from Technical Consultants with in-depth knowledge of COBOL on both IBM and ICL mainframes, to Specialists in Personnel, Payroll and Financial Systems (in-depth knowledge of computers not essential), to provide services to major accounts. Successful applicants will receive a basic salary between £10,000-£15,000 plus BUPA, Life Assurance and bonus. Opportunities to travel to the USA and Middle East.

RPG II or III Progs & Anal/Progs All Areas £Neg

We have a large number of clients offering solid salaries and promotion prospects for individuals with a minimum of two years' experience.

UNIX Experience E.8. to £15,000

The advanced systems division of an international systems and software engineering company is seeking a number of Systems Designers and Software Engineers/Programmers to work at their Software Laboratory in the development of various products for the financial markets. On-going training given.

IBM COBOL Progs & Analyst/Progs All Areas £Neg

We currently have a wide variety of positions for people wishing to advance their careers in companies with good prospects for the right individuals.

IBM PC Systems Analyst E.1. to £15,500

A major brewery company wishes to recruit an individual with IBM PC experience to provide services to their central function and regional company. Good communications and user experience essential.

Systems Analyst Croydon £10,400+mortgage

If you have 4+ years' experience with IBM 4300, DOS/VSE, CICS and COBOL background, our client would be interested in telling you more about the development work in their insurance environment.

Recruitment Consultant W.C.1. £Neg

We are currently seeking an enthusiastic individual to complement our small but successful permanent team. Ideal for workaholic looking for a return on his or her effort.

**Call Cathy, Alistair,
Chris or Debra**
for a confidential discussion
01-831 6405 After hours
We try hardest! 01-435 5466

Call Sue Newman
for a confidential discussion
01-831 6405 After hours
We try hardest! 01-435 5466/1584

WANTED-ALIVE-
THE TOUGHEST COMPETITORS
in (or out of) the business

When we say tough, we mean the sort of hard-bitten, earnings-driven Sales people who need success as a plant needs sunshine.

We are a leading U.K. data communications manufacturer, marketing innovative data comms and electronic office equipment to all sections of the business community.

Our reputation and indeed our success has been built on extreme sensitivity to market requirements, the highest technical expertise and attractive pricing.

Product lines include: Modems, multiplexors, Data exchange switches, LANs Network Access modules and our new 32-bit super mini to provide the solution to large corporate networking problems. We expect this latest product to boost company growth for beyond the current 80% p.a.

You will have a first class record selling to computer users or selling a technical product (photocopiers, components), and will wish to join a company where effort and salesmanship are rewarded by extremely high earnings and rapid career development in a dynamic organisation. Basic salaries are excellent and our top salesmen are earning in excess of £45,000 p.a.

A technical/computer background is desirable but not essential as our most successful people are those with the highest level of salesmanship. In short, we're looking for tough cookies.

For further information and on application form, please telephone our consultants Mike Reynolds or Craig Millor, or simply clip and return the coupon below. Tel. 01-637 9611

On target earnings in excess of £36,000 + 2L car and substantial guarantee

Telephone 01-637 9611

Suite 201/8 Albany House, 324 Regent Street, London W1R 5AA

MANAGEMENT & EXECUTIVE SELECTION.

NAME: _____ HOME TEL: _____

ADDRESS: _____ WORK TEL: _____

Send to Management & Executive Selection, 201-208 Albany House, Regent St, London W1 Ref M.S.1.

**Customer
Engineers**

We are one of the Gulf's leading third party maintenance companies, with contracts across a wide range of commerce and industry. Continued success has led to an opportunity for a number of enthusiastic and self-motivated individuals to work on the following range of equipment.

NATIONAL ADVANCED SYSTEMS: - AS5/AS 5000 and associated IBM/IBM compatible peripherals. (experience on IBM 370/158 will also be considered for these positions).

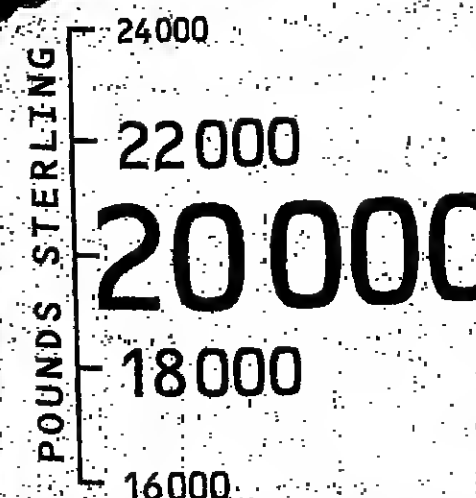
IBM: - 4300 series and associated peripherals.
DEC: - PDP11 and/or VAX series and all associated peripherals.

These positions will initially be based in Riyadh - the cosmopolitan capital of Saudi Arabia.

Engineers with a minimum of four years experience on any of the above equipment, can expect the following excellent package:

- Married or single status
- 30 days paid leave
- Accommodation
- Yearly renewable contracts
- Tax free salary
- Free return trips to the UK
- Car
- Excellent career opportunities

If you have the ability to work to the minimum of supervision, to drive to become a team leader and are looking to secure your financial future, contact our appointed consultants for further details and an informal discussion on 01-637 9611 and ask for Steve O'Brien or Chris Bond.



Suite 201/8 Albany House, 324 Regent Street, London W1R 5AA 01-637 9611

MANAGEMENT & EXECUTIVE SELECTION

SYSTEMS AND PROGRAMMING

PL/I £8-12,000

Internationally renowned marketing firm on the Midlands/Berkshire borders requires an analyst/programmer with around three years' IBM PL/I experience to take a leading role in their team. They will use OOS/VSSE, CICS and OL/I and you will be developing a range of on-line sales and marketing applications, liaising with users on a regular basis and writing specs. Benefits include annual bonus. I also have positions in London, Surrey, Middlesex and Kent for programmers with 18 months+ PL/I, offering excellent career progression, relocation expenses, etc. CW/1741

IBM ANALYST/PROGRAMMER To £12,000

My client has recently moved to North West Middlesex and houses an IBM 4341 under DOS/VSSE, VM/CMS with CICS. They require analyst/programmers who wish to strengthen their analysis skills from both a technical and business point of view. If you have two years+ IBM COBOL, DOS/VSSE, preferably with some CICS and VSAM, then I would like to tell you about this outstanding opportunity in a progressive and expanding organisation. CW/1466

RPG III PROGRAMMER CITY £11,000

My client, a financial establishment in the City, is looking for a graduate programmer with around two years' RPG III experience gained in a financial environment. In return a very attractive salary is offered together with the chance to gain analysis experience and user contact in a small but efficient D.P. department. If you are looking to increase your financial rewards and gain new skills, please contact me now. AW/4256

ANALYST/PROGRAMMER LONDON c.£11,500

An integrated manufacturing, marketing and sales company in Central London is looking for an experienced analyst/programmer to work on an IBM System 34. The position reports directly to the DPM and requires a flexible person to develop new integrated information systems and see them through to implementation. If you have RPG II programming experience and some exposure to analysis, with an innovative mind, then this company offers a high salary and many fringe benefits. AW/3017

ICL ME29 PROGRAMMERS, ANALYST/PROGRAMMERS LONDON To £12,000

This prestigious financial concern are currently looking to recruit a number of D.P. professionals to enhance their present team. They wish to hear from candidates with relevant ICL COBOL experience and knowledge of either TPS, MIS or finance. You will NOT be joining a maintenance team, as there are a number of new development projects underway. So if you have worked on a major development system and have genuine experience of on-line work, this company offers excellent prospects. BW/4400

ICL PROGRAMMERS/ANALYSTS - MANAGEMENT OPPORTUNITIES LONDON £8,000 To ??

There are currently a number of vacancies within this well-known ICL company for ambitious and talented applicants, with an integral and active role to play, on a variety of ICL hardware. This includes Dual 2960 and a number of laptops with DOS/VSSE. The development work is in COBOL and EPL/VSAM with CPM on the smaller machines. You will be working in a friendly department on a variety of financial and operational systems and must be highly motivated. Lots of user contact and sound promotion prospects. BW/4404

'DEC' SKILLS ARE WANTED

Based on the Midlands/Berkshire borders, this expanding Systems House is seeking to recruit three Analyst/Programmers with good DEC skills. You will play an integral part in a small team environment, developing systems in a variety of areas to high standards. To qualify you must have ability in one of the following: RSX-11-M, FORTRAN, BASIC++2, VAX/VMS, in either scientific or commercial applications. Training is offered in other areas and you will be encouraged to deal first-hand with the client and become involved in analysis. HW/4399

DEC PROGRAMMERS To £8,500

If you can offer six months+ commercial programming experience in a RSTS/E, BASIC+ environment, my London based client can offer you the chance to further your career and update your knowledge. This large financial organisation currently houses a DEC/POP but will be taking delivery of VAX machines in the next few months. Full training will be provided on this machine, and also in the analysis and communications areas. There is a much development work planned. Benefits include B.U.P.A., L.V. and a generous yearly bonus. HW/4392

SYSTEMS ANALYST CITY To £14,000 + Mortgage

This leading financial organisation requires a Systems Analyst with two-three years' experience in analysis and a background in on-line systems development within an IBM Hardware and Software environment. The candidate appointed will be responsible for performing data-gathering investigations in user departments, implementing and developing systems, and the supervision of system testing and staff. Excellent benefits which include Subsidised Mortgage. GW/6788

SENIOR PROGRAMMER HERTS £9,000+

This international manufacturing company based near the M1 in Hertfordshire, run IBM 3083s with CICS and DL/I. They are looking for a programmer with 18 months+ IBM COBOL and some on-line and database knowledge. They offer excellent training, the chance to develop your analytical skills, and utilise your talents and ideas to the full. If you are young and ambitious and feel that you would fit into a team environment working on development and maintenance projects, this could be the job for you. AW/4525

DATAPoint UNLIMITED OPPORTUNITIES CITY/BERKS £10-12,500

My client is a prestigious UK financial services organisation with worldwide links. Due to continued expansion they now require talented analyst/programmers with good Datapoint/Database experience for several major interesting development projects. Career progression opportunities are unlimited and if you prefer to specialise in a certain area you will be given every opportunity to do so. People with the skills and ambition to work in this fast growing and challenging environment will be rewarded with an excellent package and first-class working conditions. MW/4456

MINI COBOL ESSEX £10,500

My client, a well-known household name, urgently seeks an "above average" COBOL programmer. They currently utilise B800, minis and are in the middle of upgrading to B900s. Burroughs experience would certainly be an asset, however the company invite applications from self-motivated individuals with a solid commercial background and a minimum of 18 months' COBOL experience. The work itself involves interesting development plans and enhancements to existing systems. This company also houses IBM Hardware and as all vacancies are advertised internally the opportunity to gain on IBM will be available to you. First-class benefits include flexible, subsidised, restaurant and profit share. MW/4481

ANALYST/PROGRAMMER SUSSEX c.£10,500

An opportunity has arisen for an analyst/programmer with a minimum of two years' IBM COBOL and sound analytical experience. The installation is in an IBM 4331 with a wide range of systems under development and significant expansion on the on-line network using CICS and OL/I. The company believe they can offer a rewarding career path as the main concentration is on systems development. The position carries benefits normally associated with a large company. GW/4376

IBM SYSTEM 38 WEST END To £11,500

My client, an international consumer products group, now has openings in their D.P. department for an experienced programmer and analyst/programmer both with an RPG III background. This is an expanding department therefore the candidate appointed can expect career progression as the main emphasis of the positions will be the implementation of new systems. To discuss these positions further please contact me as soon as possible. GW/4349

HONEYWELL PROGRAMMER/ANALYST DEVELOPMENT. EXCELLENT TRAINING MIDDX To £14,000

This well established system house is looking to recruit a number of additional highly motivated staff to enhance its present dedicated but small, informal team. If you possess a proven programming background with two years' experience, of which at least 12 months has been on Level-6, OPS6 with COBOL and/or Screenwriter and wish to join a fast, stimulating environment you will be well rewarded. The company offer good training and a career development. BW/2469

IBM SYSTEM 38 WEST LONDON c.£12,000

My client is an established consumer group with a household name. They house a range of hardware including IBM Mainframe and System 38, and are seeking a programmer/analyst with two years+ experience, and at least a year of RPG III on IBM System 38 to join a small development group. They offer the opportunity to exploit your ideas and enhance your skills with further training, user contact and a degree of responsibility, coupled with a full range of company benefits. CW/2161

MICRO PROGRAMMER NEW PROJECT LONDON £10,000

This major British organisation has recently organised their D.P. department to support the use of Microcomputers. The company utilise a wide range of Micros from a 32-bit machine to the BBC. They require a self-motivated person to join a small team, initially specialising in the development of Microcomputer software to assist in the problems of data communications across a fairly wide range of hardware. Experience of one or more of the following is required: 800 Assembly, CPM, MS/DOS/UNIX, X25, SWA, BSC. In return the right candidate will be offered excellent long-term career prospects and a full range of benefits. MW/4480

HEWLETT PACKARD STOP PRESS!!!!

Senior Analyst/Programmer. European Travel. £14,000 Berk. D.P.M. Aged 30+. 10 years+ good HP 3000. £20,000 Berk. Analyst/Programmer. Lots of development. £11,500 Herts.

Project Leader. Great prospects. £15,000 + Car Beds.

Analyst/Programmer. Manufacturing exp. £13,500 Essex.

Systems Analyst. Knowledge of IBM. Management prospects. £13,500 London.

Programmer/Analyst. Existing applications. Lots of analysis. £12,500.

These are just a selection of the positions we have available in London and the Home Counties. If you have 12 months+ experience in systems and programming, on any machine, we would like to hear from you.

OECD ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

Headquartered in Paris, the OECD is a major international Organisation collecting and processing large volumes of economic data.

To respond to the growing demand for information processing services from economists and statisticians, the Organisation is currently seeking two high-level professionals for its Computer Operations Division.

DEPUTY OPERATIONS MANAGER

Responsible for the planning and supervision of the day-to-day operations and maintenance activities for the Organisation's Burroughs and IBM computer installations, the successful candidate will have a:

- minimum of 4 years practical experience in data communications;
- expertise in standard communications protocols, European standards for local area and international networks, and good knowledge of communications software.

DATA COMMUNICATIONS ANALYST

Reporting to the Head of Systems Software, the appointee will be responsible for the installation and maintenance of several Burroughs and IBM networks and for the development of the communications software.

The successful candidate will have a:

- degree in data processing or other relevant discipline;
- minimum of 4 years practical experience in data communications;
- expertise in standard communications protocols, European standards for local area and international networks, and good knowledge of communications software.

Familiarity with Burroughs data communications and software is desirable. (Ref. WEEK 183) 33

Attractive salaries and excellent benefits are offered. Work will be carried out in Paris but occasional travel might be necessary.

Vacancies open equally to both male and female candidates.

Applications from nationals of member countries, together with detailed CV form in English or French and specifying the chosen post should be sent to: Personnel Division OECD, 2, rue André Pascal 75776 PARIS CEDEX 16 (ENCL)

STROUD - IN THE COTSWOLDS

ANALYST/PROGRAMMER

to be responsible for maintaining existing systems and developing new systems to run on an IBM System 34. The successful applicant must have proven experience of RPG II programming and the ability to understand, analyse and react quickly to user requirements. Solid experience is more important than academic qualifications and a working knowledge of engineering and financial systems in a manufacturing environment will be of help.

We are an international leader in Mechanical Handling Engineering and the successful applicant, who must have a versatile approach, will report to the Systems Manager.

Please apply with full details to: The Personnel Officer, Redler Conveyors Limited, Duddridge, STROUD, Gloucestershire GL5 3BY. Tel: (045 36) 3811. (ENCL)

WORKSHOP SUPERVISOR TO £12K + XRS

Our client is one of the leading manufacturers of multi-user, multi-tasking, small business systems. They urgently require a Workshop Supervisor for new, purpose-built premises in London NW1. Responsibilities include supervising the workshop and associated bench and commissioning engineers, technical support and all necessary paperwork, fault-finding and repair to component level on systems running under CPM and MP/M with Winchester and floppy drives, delaywheel and matrix printers, etc. Excellent prospects in an exciting environment with a salary to £12K + XRS and all usual big company benefits. Don't delay, ring today. Ref. EW172. (ENCL)

db executive (kingston) ltd

39 Lion Street, Kingston Upon Thames, Surrey Tel: 01 549 6441 (24 hrs) Specialists in Computer Sales

TELECOMMUNICATIONS UP TO £14,000

SPECTRUM DATA SERVICES is a rapidly expanding telecommunications consultancy. We are involved with the planning/implementation of voice/data networks both nationally and internationally.

We are looking for:

- ★ CONSULTANTS/TECHNICIANS BASED IN SURREY
- ★ A TECHNICIAN TO WORK FOR ONE OF OUR MAJOR CLIENTS BASED IN ESSEX

Applicants should be prepared to travel within Europe and have a minimum of 3 years' experience in the telecommunication field. Ideally they should be educated to at least ONC level but applicants with the appropriate experience will be considered.

Please write for an application form to:

SPECTRUM DATA SERVICES LTD 201-205 Kingston Rd Leatherhead Surrey KT22 7PB Tel: 0872 377819

THORN EMI Electronics Defence Systems Division, a leader in the fast-developing defence industry, is undergoing a period of sustained growth, at its attractive Woking location. We currently have an opportunity for a

Real-time Programmer

to work in a small team designing real-time software for underwater acoustic tracking systems, using PDP11 or HP1000 computers. The work will involve module design, coding, test and commissioning. The projects involved will make use of FORTRAN, PASCAL and Assembler, and either RSX11 or RTE-A.

If you feel that your previous experience fits you for this task, send your cv to Janet MacLeod at THORN EMI Electronics Limited, Defence Systems Division, Albert Drive, Sheerwater, Woking, Surrey GU21 5RU.



PROGRAMMER/ANALYST - YORKSHIRE

To meet growing demands for systems development we require an additional experienced Analyst/Programmer.

The person appointed will join a small team involved in all phases of programme development and is likely to have:

- ★ Two years' COBOL programming experience
- ★ Knowledge of Data Base Management and Communications Systems
- ★ Current driving licence

The company is a member of Hapworth Ceramic Holdings PLC and is the world's largest manufacturer of vitrified clay underground drainage systems and cable conduits. The successful candidate will be employed at the headquarters of the company which is situated in a rural location eight miles from Huddersfield and 15 miles from Sheffield.

CV details to Computer Manager: The Hapworth Iron Company Limited Hazlehead, Stocksbridge Sheffield S30 5HG (ENCL)

FOR CLASSIFIED ADVERTISING USE DIRECT LINES

RECOMMENDED CONTACT NUMBERS (01) 661 8787

WISSET ADVERTISERS (01) 661 8080

FLY HIGH! IN REALTIME S.W.

This is your chance to help develop a new, integrated cockpit system - that makes it work in FLIGHT! This is one of the company's most exciting projects. You will be using 16-bit micro, VAX, LANE and PASCAL - with a leading name in innovation. If you are well qualified and have good oral and written communication skills, REALTIME SOFTWARE experience then call me, Vincent Melling, NOW on 01-549 6441 (24 hours) - for further details. (ENCL)

TECHNICAL SUPPORT C. £12,000

Update Computers, a young and expanding systems house, is looking for a capable and experienced person to be responsible for providing hardware support and to help in the further development of its systems.

Applicants should be experienced in maintaining microcomputers, hard disks and other peripheral equipment down to board level. Experience with local area networks would be an advantage.

A successful person could look forward to a larger role within the company.

Present systems are based upon the IBM PC.

Benefits include 5 weeks' annual leave, a non-contributory pension scheme and a private health scheme covering the applicant's family.

Central London location.

Contact: Amanda Naylor

Update Computers Limited 33-34 Alfred Place London WC1E 7DP Tel: 01-437 4844

Enhancing Patient Care

DISTRIBUTED NETWORK

No-one has done more than our Client to apply microprocessor-based hardware and software techniques to railway signalling and information systems.

One of their latest developments demonstrates their technical approach, and says a lot about the company as well.

It's a micro-based train describer system that gives signaller a clearer, more detailed picture of exactly what's happening where on all the route miles under their control.

To develop the system, our Client's engineers designed their own microcomputer units, based on the Intel 8088, and then configured them into a highly ingenious distributed network.

While the hardware specialists were perfecting their own micros, the software people were using the Company's 2 Mbyte VAX 11/750 to develop an equally specialised distributed operating system which routes individual processes via a low-speed asynchronous ring.

It was a typical project for our Client's Electronic Systems Department - technically challenging, but small enough to give everyone a real sense of involvement and achievement.

It's also typical of the projects you could be handling as one of the additional men and women our Client now needs as a direct result of sustained expansion in railway and mass transit systems markets throughout the world.

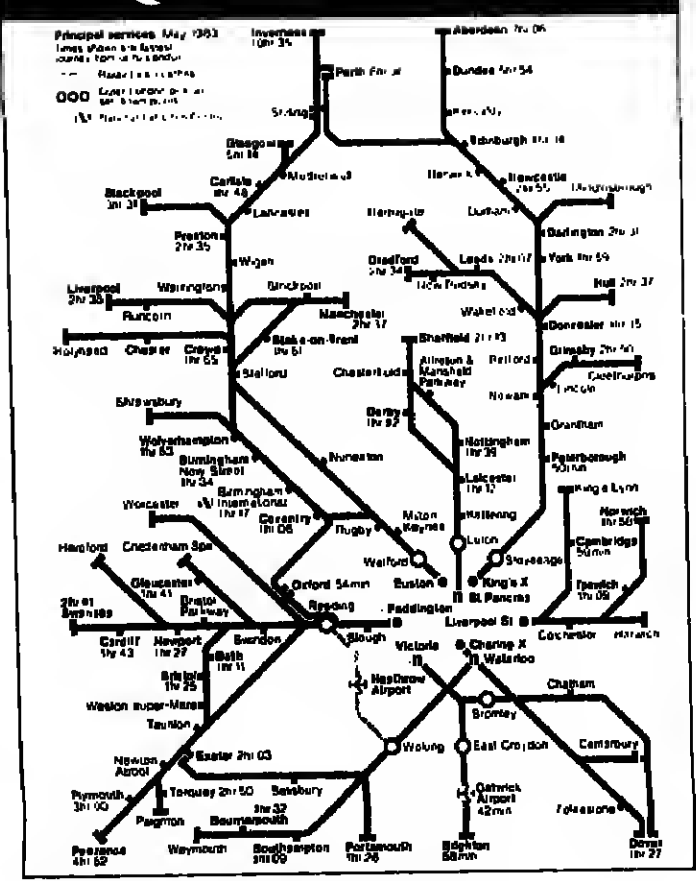
Development Engineers c.£10K-£14K

You'll have a degree or equivalent in electronics, computer science or a closely related discipline. Your experience - as little as a year, or three years for senior appointments, will have been in a microprocessor-orientated development environment and will have given you a useful knowledge of digital logic techniques, using both ICs and discrete components.

Programmers c.£10K-£14K

Maths, computer science, electronics or a closely related discipline will be your degree (or equivalent) subject; real-time systems will form the basis of your experience, which could range from a year, to a minimum of two years for senior roles, for which you'll need design as well as implementation experience. You'll need a knowledge of at least one high level language, such as ALGOL 60 or PASCAL, and at least one microcomputer assembler language. Finally, you should be familiar with the concepts of structured programming and top-down approach to systems design, and have worked with Intel microprocessors.

InterCity Services



As you can see, our Client isn't backward in coming forward where money is concerned - nor on the subject of benefits, which include relocation assistance (although if you live to the North of London you won't find travelling a problem), and the very real advantages of flexible working hours.

A phone call on 01-437 9261 ext 218 between 10 a.m. and 6 p.m. today and tomorrow will bring a swift response with detailed information about the Company, the jobs, and what the future could hold for you in applications areas that has huge worldwide potential. Even outside these times you can still get the application process moving by leaving a message on our 24-hour answerphone (01-439 3410).

Alternatively, you could write briefly to Confidential Reply Service, Ref. ASD 8950, Austin Knight Advertising Limited, London W1A 1DS.

Austin Knight Advertising

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As an International corporation, operating a computer based worldwide banking telecommunications network, we are now developing our second generation system, enabling more performing services and launching of new products.

Therefore, our R & D department requires

highly creative software specialists (m/f)

to participate, within a project team, in specifying, design and implementation of the coming network system.

This is a job for experienced (at least 5 years) software specialists with a solid university background (Polytechnic, civil or commercial engineer) and a strong drive to conceive highly sophisticated large scale network systems. Fluency in English is essential, other languages are a definite advantage.

Our company offers these outstanding career opportunities in a young international team with an excellent working environment and a very good financial package.

Please submit your detailed resume and photo to our consultant:

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First interviews will take place in London.

All applications will be answered. Absolute discretion is guaranteed!



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that not only provide a 'ground-floor' opportunity within a fast growing and progressive organisation, but which also gives the individual salesperson freedom of action, scope for creative selling and real involvement in shaping the destiny of the company.

Our client is a well established name in both minicomputer based turnkey systems and computer terminals and has secured some 25% of a specialist market. Such is the success, that all of their existing salespeople consistently achieve target. This is most likely due to the company's unusually high investment in advertising.

We are seeking three accomplished salespeople; one with significant experience of selling DEC based commercial and industrial Turnkey Systems up to a value of say £200k, and two with a good track-record of selling Computer Terminals. In the former case, a pre-sales support enclust would also be considered. In the latter case, some exposure to DEC equipment will be advantageous, but not imperative. Whereas, a proven ability to communicate at a senior level, is essential.

An attractive compensation package is negotiable, including a company car and a variety of fringe benefits.

Please contact Lindsay Howie (London), or Roger Dodd (Midlands), quoting reference HSC/024.

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Please contact Sue Barker on 01-863 0621 to arrange an interview or write to the above person enclosing a curriculum vitae at ADM Limited, Equitable House, Lyon Road, Harrow, Middlesex.

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Nuclear Enterprises design, manufacture and market nuclear radiation detectors and systems for physics and life sciences applications.

The Company is established as a world leader in these fields and owns its position as a continuing investment in its development and R and D programme.

A vacancy now occurs in our Edinburgh Laboratories for a

SOFTWARE MANAGER/ SPECIALIST

Reporting to the Technical Manager, the successful candidate will be responsible for a small software department. The job combines development of new software with technical support and requires interaction with colleagues in both marketing and production departments of the Company.

Candidates should hold a degree in Computer Science or a related discipline and have a minimum of six years' experience of software development. This should encompass experience in RSK - 1M - PLUS and in particular with device drivers together with a working knowledge of FORTRAN and PASCAL.

An important aspect of the job will be liaison with hardware design engineers which will require an appreciation of the hardware/software interface. The design of software packages incorporating numerical curve fitting will also be required. Supervisory experience would also be an advantage.

Nuclear Enterprises is a member of the THORN-EMI group of Companies and the salary and benefits package will be commensurate with being part of this large International Group of Companies.



Applicants, male or female, should apply in writing giving details of age, experience and current salary to: Personnel Department, Nuclear Enterprises Ltd, Sighthill, Edinburgh EH11 4BY.

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Immediate openings in USA for suitably qualified graduates with experience in UNIX, C, PASCAL, FORTRAN, and other languages in London, attractive remuneration.

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(8436)

BOX NUMBERS

Box number replies should be addressed to:

Box Number
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Quadrant House
The Quadrant
Botton, Surrey GU8 5AB

SYSTEMS PROGRAMMER

PASCAL, MICROPROCESSORS

We are a company specialising in cash management processing systems utilising Intel 8086 based equipment and are presently seeking a programmer to augment our existing software department.

The ideal candidate will have a sound practical knowledge of Pascal, and be strong in Customer liaison skills.

A competitive salary together with Private Medical and Income Protection Insurance is offered plus opportunities for travel in Europe and the USA.

Please contact Len King on 01-844 1234 for further information.

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from £700 p.w.

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Requirements for this position include good MUMPS experience, PDP/11 and VAX/VMS technical background. Preferably with experience in the oil industry.

INTERGRAPH SPECIALIST from £700 p.w.
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Solid Intergraph experience on system level is required for this vacancy. Experience with IGOS/8.

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A technical background with oil industry experience is preferred for the above position. Also knowledge of IBM, TSO, SP, FORTRAN and MARK IV.

Please write giving full career details to: Mr. J. Donaldson, Jagday Computer Consultancy BV, Nasseuseaan 15, 2641 JT The Hague, The Netherlands.

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UP TO £15,000

A move into management is offered the O.P. professional with extensive COBOL programming experience in a multi-user real time environment. Reporting to the Financial Director, the EOP manager has total responsibility for the main computer installation, a new OG MV4000 replacing the Eclipse C300, and with the assistance of two operations staff, for providing EOP services to the company. Responsibilities include application systems development and maintenance, introducing new information processing methods, and working with other group companies.

With sales of £3½ million, 140 employees, and new top management, Ealing Back Limited, the subsidiary of a small U.S. public company, is increasingly successful in its business of manufacturing optical components and distributing them worldwide through catalogue selling.

In this stimulating environment, the immediate task of the successful candidate will be completing the conversion of existing commercial applications to the new equipment. The next major project is to introduce new production control systems, for which experience of manufacturing systems would be a distinct advantage. If you believe you can succeed in this position, please write with details of your career to Chris Hodgeon, Ealing Back Limited, Graycaine Road, Watford WD2 4PW.

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TEL: WATFORD 109231 42281 TELEX: 035728 (8419)

Fortran Programmer

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That's true whether you're a graduate heading for the starting post or someone with one or two years' experience.

You'll be joining UIS, a leading computer services organisation with a national network of offices and a well deserved reputation for its wide ranging professional services to industry and commerce. We're well equipped to provide rewarding career paths for people who can match our pace of progress.

The job involves maintaining existing systems - on a database linked to FORTRAN programmes and developing new systems using MVS/DOSE based micro linked to the mainframe by UIS's own communications software for screen data entry.

Initially, we can offer a salary up to £8½K, a happy working atmosphere in a very pleasant part of Surrey, and everything else you'd expect of a major organisation such as UIS. For more information contact Mike Middleton, United Information Services Limited, United House, 56/64 Leonard Street, London EC2A 4AN. Tel: 01-263 1066.

UNITED INFORMATION SERVICES

COMPUTER PROGRAMMER

Thorntons, the well known quality confectionery manufacturers are looking for an experienced programmer.

Candidates (male or female) should have considerable programming experience using COBOL, and familiarity with Hewlett Packard and 3000 hardware would be an advantage.

We offer an attractive salary, excellent working conditions and a full range of facilities. Please telephone or write for an application form to Executive Manager/Personnel, J. W. Thornton Limited, Derwent Street, Belper, Derby DE5 1WP. Tel: Belper (077 382) 4181.

Thorntons

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Rapid Recall and Rapid Terminals are recognised as the leading U.K. distributors of Microcomputer components, boards, systems and peripherals. With offices based in High Wycombe and Nantwich our sales are exceeding £20 million per annum. Our success is based on offering our customers the best technical sales support in the industry, and we're now looking for a number of exceptional Sales people to join our informal team.

Internal Sales Engineers - Rapid Recall and Rapid Terminals

Internal Sales is a major stepping stone for career advancement into Field Sales or Marketing. Responsibilities include customer visits and telephone interface, preparing quotations and supporting our Field Sales Engineers. Sales experience is not totally necessary and hence makes this an attractive opening for junior design engineers wishing to enter into sales.

Field Sales Engineers - Rapid Recall

Our dramatic growth has meant that new sales areas have been created into the North and South of England. Responsibilities include the sale of DEC, Intel and H.P. products and knowledge of any of these product or sales experience is desirable.

Digital Sales Specialist - Rapid Recall

A totally new position for a person currently selling to software houses and small OEMs. A knowledge of Digital's microcomputer range would be preferable although not essential.

Commercial Systems Sales Engineers - Rapid Recall

Our recent appointment as the exclusive U.K. distributor for Intel Commercial Systems has created a sales position for taking these products both into the OEM and end user market. The ideal applicant will have an appreciation of commercial systems and the IBM product.

Field Sales Engineers - Rapid Terminals

We need to fill a new position based at High Wycombe with responsibility for a fast-expanding product area that includes Digital Terminals, Environ Colour Graphics, Summagraphics. Relevant experience is necessary.

Product Manager - Rapid Recall

A new marketing position has arisen with responsibilities including product promotion planning, interface with the principals and our salesforce, stock profiling and identification of new market opportunities. An electronic or sales background plus experience with micro-based products is required.

Our success depends on the quality of our staff and, as such, we are prepared to meet the remuneration requirements that such team members require.

Rapid Recall
Rapid House, Denmark Street,
High Wycombe, Bucks. HP11 2ER.

If you feel that you might enjoy
working in our team, why not ring
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and speak to Karen Cahill.

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+ U.S. TRAINING

Our client, a leading manufacturer in micros, has a ground-floor opportunity in its London office to become the senior support representative. He or she will be expected to make customer visits in pre- and post-sales situations, to present the detailed benefits of our client's prestige products, evaluate problems and propose solutions whilst being prepared to modify standard software. Freedom to exercise own initiative is a key part of this position and our client will consider applicants with a view to future progression.

STOP PRESS... U.S. 32-bit mini manufacturer offers new opportunities in office automation - comms, etc., applications to support people with ambition!

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PROGRAMMERS FOR THE TRAVEL INDUSTRY
TRAVEL AND SPECIALIZED COMPUTERS LIMITED
THE COMPANY

TAS Computers is a London-based company which, for a number of years, has been a leader in the field of providing computer systems for travel agents, tour operators and airlines. We have a rapidly expanding software development programme and require a number of programmers with various levels of expertise and experience to assist in accelerating these developments.

THE JOB

You will be working within one of our small project teams on highly sophisticated mini-computer systems developing interactive programs in several areas of our business. For all posts, a knowledge of Cobol and/or assembler languages gained in a user-oriented environment will be an advantage.

THE BENEFITS

Salary and company benefits will be made attractive to the high-calibre people who we expect to join our company. We also offer an enthusiastic and friendly working environment where you will have opportunities to show initiative and be rewarded for your efforts.

Please send full cv, including details of current salary, to: Maria Vincent, Software Manager, Travel and Specialized Computers Ltd, 141-145 Curlew Road, LONDON EC2.

elf

Cobol Programmer

Altrincham, Cheshire

c. £7,750 p.a.
+ benefits

Elf Oil (G.B.) Limited, the Marketing Division of an International oil company, have a vacancy for a Cobol Programmer at their Head Office.

The Computer Department is small and internal utilising a Honeywell DPS/82 two-megabyte processor. This marketing forms the basis for an exciting development programme using remote communications.

Applicants, in their 20s, should have at least six months' TSO Cobol experience on a similar Honeywell machine. Benefits include contributory pension and life assurance scheme and luncheon vouchers of £220 p.a.

For a job description and application form, please contact:

The Personnel Department
Elf Oil (G.B.) Limited
on 0411 828 677

TECHNICAL SUPPORT

You will be responsible for providing technical support and trouble shooting backup to the wide range of software that we distribute for CP/M, CP/M-86, PC-DOS, MS-DOS and other related operating systems.

This position provides an excellent opportunity for expanding your knowledge in the area of the latest developments in the fast-moving software industry.

Applicants will preferably be graduates in computer science or related subjects, however, relevant experience and the ability to work logically on a customer oriented outlook is equally important.

As part of the Comart Group of Companies the above vacancy has a range of benefits including pension scheme, company share scheme, sickness benefits and 20 days holiday p.a.

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Telephone: (0703) 871211

XITAN

COMPUVAC

COBOL PROGRAMMERS

We currently have a large number of openings for COBOL Programmers. Ideally you will have worked on IBM mainframes for at least one year and have some knowledge of software, especially CICS and DL1 or IMS. Vacancies exist in and around London.
REF: LD/CW

TO £12,000

PL1 PROGRAMMERS

A number of clients based in London and the Home Counties are looking for PL1 Programmers at all levels. Any experience of CICS or IMS would be advantageous but not mandatory and most opportunities offer a good career path into Senior Programmer and Analyst positions.
REF: LD/CW

TO £11,500

ANALYST PROGRAMMERS

Our client based to the South West of London is urgently seeking Analyst Programmers with a good knowledge of COBOL or PL1 on MVS or DOS systems. You should also have experience of on-line systems working from feasibility through to implementation.
REF: LD/CW

TO £14,000

SYSTEMS PROGRAMMERS

Based in the London area, our clients are looking for experienced people with a sound knowledge of DOS, VM or MVS systems. Applicants must have experience of some of the following: CICS, ACF, VTAM, DL1, IMS, TSO, SNA. A number of the positions include generous benefits packages.
REF: RC/CW

TO £19,000

SYSTEMS ANALYSTS

Candidates should have up to five years' experience in Analysis and would have seen a major project from feasibility through to implementation. You should possess good communications and supervisory skills and preferably have worked on the database side. Positions are based in Home Counties and London.
REF: RC/CW

TO £15,000

IBM CONSULTANCIES

A large software house based in Central London are looking to recruit senior data processing personnel in a number of areas with sound IBM mainframe experience on OS or DOS/VS systems. A previous programming background in ASSEMBLER would be desirable as is proven supervisory or management experience.
REF: RC/CW

TO £20,000

SYSTEMS DESIGNERS

A number of clients in Greater London are looking for Systems Designers with at least two years' experience in Analysis and Design. Applicants should have good user communication skills and have project control and implementation experience. A programming background is preferred, especially at senior levels as the positions are more technical than business orientated.
REF: RC/CW

TO £13,000

RPG3 PROGRAMMERS

Vacancies exist in all areas including banks for experienced System 38 professionals. Job duties range from raw data to training in financial analysis. Minimum of one year's RPG3 experience.
REF: MB/CW

TO £14,000

GSD CONSULTANCIES

Three progressive, expanding software houses all based in the Greater London area have requirements for confident RPG professionals with good oral and written communication skills for consultancy roles. Previous software house experience an advantage but not essential.
REF: MB/CW

TO £20,000

UNIVAC 1100

Demand for 1100 professionals is currently very high with positions all over the Greater London area but particularly in the Northern Home counties. Any T.P. or Database experience would be advantageous.
REF: CC/RV

TO £14,500

IDMS/TPMS PROFESSIONALS

A minimum of one year's experience of IDMS or TPMS coupled with a sound ICL COBOL background can secure you a career move well worth taking. Standards are high but so are the rewards. If you feel you can fit the bill, call now!
REF: CC/CW

TO £15,000

HONEYWELL COBOL

Level 84 or 88 experience is required by our client for roles as Programmer or Analyst/Programmer on development projects. Experience of at least one of the following preferred: DMV, IDS, TDS.
REF: CC/CW

TO £15,000



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(0416)

MAXIMISE YOUR POTENTIAL

Our Client, a major driving force in the semi-conductor industry, has spearheaded many of the technical innovations over the past decade. The European Division of this major blue-chip Organisation is making full use of systems innovation to enhance and benefit the efficiency of their operations. With plants throughout Western Europe, the systems are developed and supported by a Central Support Group based in the UK. Due to major developments in hand and the need to further enhance this facility, they are able to offer two unique career opportunities for the following:

Programmer/Analyst

£8,500 - £11,500

+ Benefits

You will be developing and supporting systems throughout the European Division and will need to travel as required spending short periods off site if necessary.

Your skills will have come from IBM experience probably 370 based, including COBOL/DL1. With an integrated systems policy the use of communications and interface facilities incorporating TSO/SPF, is standard.

The role will demand self discipline in organising your own schedules and a business approach in analysing requirements and dealing with end users at all levels and in a variety of situations. Without doubt a challenging role, in an Organisation where ability, not length of service, is the criteria for career progression.

The current environment utilises IBM mainframe facilities, with a range of minis and micros throughout the installation. Providing services to a group utilising over 22,000 terminals, 8,000 stand alone processors and 470+ disk drives creates a dynamic environment offering tremendous challenge and interest. These career openings within this highly regarded Organisation represent the opportunity to see yourself develop to the leading edge of the industry. Additional benefits include profit sharing, private health plan and full relocation where necessary.

Candidates should contact **Brian Harris** on **021 236 3761** (24 hour answering service) or send a current Résumé to the **Birmingham** address shown below at the earliest opportunity.

Technical, Sales & Management Appointments



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021-236 3761

NORTH
International House, 84 Deansgate,
Manchester M3 3EE
061-833 8427

BELGIUM
Avenue Louise 327,
Boite 4, 1050 Bruxelles
010 322-640 715/71

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PROJECT MANAGER

£15,000



Babygro Ltd., a leading manufacturer of babies' and children's clothing, employing 500 people at their Kirkcaldy and Cowdenbeath factories, wish to appoint a Project Manager for an initial 2 year contract.

The person appointed will lead the implementation of the company's Interactive Manufacturing Control System utilising NCR 9040 system hardware.

Reporting directly to the Director of Finance, the successful applicant will have the maturity and personal authority to liaise with both senior management and end-users to ensure the satisfactory completion of the project.

This key role demands a high degree of enthusiasm to get the job done. Previous experience in a manufacturing environment is essential and a knowledge of COBOL and previous NCR equipment exposure is desirable.

A salary of £15,000 p.a., free life insurance and assistance with relocation to this attractive part of Fife, within easy reach of Edinburgh, will be the reward.

If you feel that you have the experience and ability for this demanding opportunity, please call Jenny Combe on 031 226 5381 for a confidential discussion; alternatively forward a detailed C.V. to her at:

ATA Selection & Management Services Ltd.

Anglia House
26/28 Frederick Street
Edinburgh EH2 2JR



City OPERATIONS

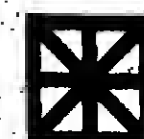
Deputy Controller to £10k

An ideal opportunity for a conscientious Senior Operator/Shift Leader to move into a Days Only Supervisory position. Our client is a progressive organisation with markets worldwide and an annual turnover exceeding £95m. The London office is the focal point of their operation. The Data Processing department has a good reputation within the company and is recognised as a vital part of their business.

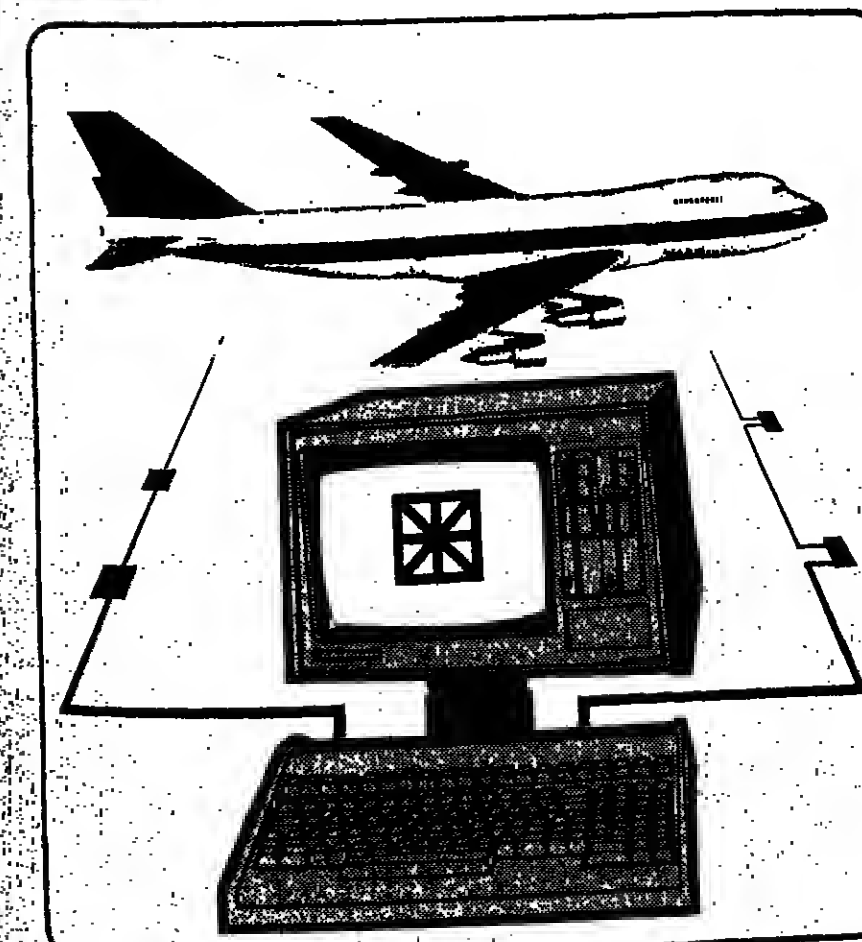
The configuration is a Honeywell DPS4 (75MB) running under GCOS4, one PERKIN ELMER 3220 (IMB) and one PERKIN ELMER 3230 (2MB). Whereas knowledge of these disciplines would be preferable, comprehensive training will be provided for the right applicant with a good supervisory background. You will be responsible for the effective and efficient operation of all computer systems both in the computer room and in the user departments. The appointment involves an element of hands-on operating and in addition you should possess good administrative skills and the ability to communicate at all levels. Ideally you will have 1-2 years experience in a similar position within a small D.P. environment. To learn more about this challenging role contact **Steve Parsons** on 01-836 8411 or send your curriculum vitae to Co-Operators 68-69 St. Martins Lane, London WC2R 1JS.

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The company is now able to offer software engineers large turnkey development projects in the fields of

- * Network Protocols (including latest ISO standards)
- * Terminals and Hosts Protocols
- * Electronic Mail
- * High level Protocols (file to file transfer)
- * Specialized airline protocols
- * Network Management

Candidates should be software engineers with project experience in software development in datacommunications or real time environment or have programming skills in PASCAL

C
ASSEMBLY languages

For further information please contact **Brian Harris** at O.C.C. on 0270 627206 daytime or 0270 629454 evenings or weekends. Alternatively contact **Steve Cook** of Christian Rovsing Systems on 0734 869010 or write to him at Gloucester House, 478a Basingstoke Road, Reading.

SENIOR PROGRAMMERS IBM CICS COBOL INTERNATIONAL BANK

This leading European Bank, well established in the heart of the City, is undergoing substantial expansion and requires two additional senior programmers. These candidates must have a certain spark, enthusiasm and imagination, and in return for these qualities will be offered a remarkable opportunity. The Bank has IBM 4341s with CICS and advanced online database systems and needs people to:

- Design CICS COBOL Systems
- Work in the centre of CICS expertise
- Provide guidance to other programmers
- Demonstrate analysis potential for the future

This organisation employs teams of dedicated individuals, who use their initiative to participate in developing new systems and are given the freedom to use their creativity.

THE SALARIES ARE COMPLETELY OPEN: There is no fixed scale for these positions.

You will negotiate your salary to reflect the experience and future contribution you can make. You will also be entitled to the very substantial benefits associated with a major banking institution.

For details phone Jill McGill on 01-734 9723 or 263 2261 (evenings and weekends)

(8414)

CTR

Computer Technology Recruitment Ltd.
Triumph House, 189 Regent Street, London W1R 7WD.

OVERSEAS CONTRACTS U.S.A.

Systems Analyst	IBM IDMS-DC	New Jersey	Urgent
Analyst/Programmers	IBM IDMS-DC	New Jersey	Urgent
Systems Programmers	Univac 1100 EXEC/DMS	New York	Urgent
Analyst/Programmers	IBM IMS DB/DC COBOL	New York State	Urgent
Database Administrator	IBM IMS DB/DC	Boston	Urgent
Programmer/Analyst	Univac V77 COBOL/Assembler	New York	Urgent
Database Administrator	Univac 1100 DMS 1100	New York	May
Programmer/Analysts	UNIVAC	All Areas	Urgent

EUROPE

Programmer/Analyst	IBM Series 1 EOL COBOL	Brussels	A.S.A.P.
Programmer/Analyst	VAX 11/780 VMS, RTL2	Holland	April
Systems Programmer	DOS/VSE and MVS	Amsterdam	A.S.A.P.
Systems Programmer	COPICS Internalist	Holland	A.S.A.P.
Programmer	IBM, PL1, IMS DB/DC	Brussels	A.S.A.P.
Programmer/Analyst	IBM MK4 IMS DB/DC	Rotterdam	A.S.A.P.
IBM Systems Progs.	All Operating Systems	Frankfurt/Munich	A.S.A.P.

Permanent

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London 01-734 0152

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CONSULTANTS

Programming Support Limited

your appointments register

Programmers

NCR/IBM/COBOL to £15K
Insurance Banking London - H. Counties - N. Eng.

COBOL/PL1/OS/CICS/IMS to £13K
Commercial H. Counties Midlands - Manchester

PROGRAMMERS DATAPOINT to £12K
Banks

ICL/COBOL to £12K
Two years' commercial experience

DEVELOPMENT PROGRAMMERS to £14K
CP/M + DEC

RPG 2/3 to £14K
Minimum one and a half years' experience
Northants/Leicester/London/N.E.

SYSTEMS PROGRAMMERS MVS CICS to £17K
Systems experience

BASIC/ASSEMBLER to £15K
Mini/Micro Computers

MINIS to £12K
Commercial Applications Norwich/Croydon

APPLICATIONS PROGS COBOL "C" and Unix to £14K
London

Analyst/Progs

DEC to £15K
Industrial Applications Bucks

IBM 34/38/4341 to £15K
London/Herts Counties/Leicester

HP3000/280 to £14K
Assembler Micro Processor Based Applications
Midx.

MS/DOS to £16K
"C" Detacomme experience
Midx.

Hardware/Support

TECH. SUPPORT MANAGER to £16K + CAR
IBM DOS/VSE CICS IDMS Kent

SERVICE ENGINEERS to £12K
DEC exp. London

SOFTWARE SUPPORT ENGINEER to £14K
FORTRAN essential Middlesex

OPERATION SYSTEM SUPPORT to £15K
Mainframe/Assembler experience Bucks

DEVELOPMENT ENGINEER to £14K
Video Terminal Manufacture Midx.

TECHNICAL SUPPORT to £12K + CAR
IBM Installations Nationwide

Systems Analysts

SPERRY 1100/FORTRAN to £14K
DATABASE Techniques

CAD/CAM to £14K
Realtime - Modelling Manx/Essex/South

IBM/BURROUGHS to £15K
Commercial Accountancy London/Surrey/Hants

BASIC plus/PDP to £14K
Tunbridge Wells

IBM/ICL to £14K
Commercial Applications London/Middlesex

ICL 2900 to £14K
COBOL Dorset

Software Engineers

CORAL/PASCAL/MASCOT/C to £15K
Communications
Glos/H. Counties/Middlesex/Bucks

REALTIME to £15K
Experience in embedded Micro-Processor Systems and M.O.S. Devices

MILITARY SYSTEMS/RADAR to £17K
Coral - Mascot Hampshire/Surrey/Essex/S. Wales

PDP/VAX/INTEL to £16K
High Level Assemblers in Derby/Surrey/London/Kent

FORTRAN 77/ASSEMBLER to £16K
Coral/Mascot/APT/Communications/Protocols

HP3000/INTEL to £12K
CAD/CAM/ATE Hants/County

Z80/ASSEMBLER to £11K
BI-Lingual Terminals/Emulation Surrey

Snr Appointments

INTERNAL SALES ENGINEER to £12K
Micro Development Data products, Logic and Development Analysts

SALES EXECUTIVES to £20K
Mainframe Nationwide

CONSULTANTS to £18K
CAD/CAM Nationwide

SYSTEMS MANAGER to £16K
Networking Systems and Communications MOSES Datapoint ARC

SALES EXECUTIVES to £20K
Personal computers/IBM Systems Surrey

MICROCOMPUTERS to £20K
Local Area Nets through Distributors and OEM's South

SOFTWARE SECTION MANAGER to £18K
Pascal/C/Microprocessor Essex/Middlesex

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Sloangate

The Appointments Register

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MANAGEMENT & EXECUTIVE SELECTION

telephone
01-637 9611

COMPUTER SERVICES CONTROLLER - Direct Mail

One of the country's leading Direct Mail companies requires a Computer Services Controller with proven ability.

Their current success and future growth is dependent on bureau based computer systems for the manipulation and delivery of data that must meet the exact needs of clients.

To manage these vital functions, from their central London offices, requires an enthusiastic professional, with strong organisational ability and a background that includes:

- ★ Considerable knowledge of the use of computers in direct mail
- ★ Familiarity with de-duplicating techniques and printing methods
- ★ Provision of systems advice to clients
- ★ Control of computer services via terminals
- ★ Job scheduling

A generous salary will be paid, commensurate with experience and the importance attached to the position. Excellent company benefits include: a generous travel allowance, participation in the bonus scheme, pension and free medical insurance.

Please contact Tim Pearce or Ivor Brookstone on 01-637 9611 or send your c.v. to the address below.

Please advise which companies you do not wish to have your details forwarded to.

(1203)

Suite 201/6 Albany House MANAGEMENT & EXECUTIVE SELECTION
324 Regent Street London W1

ENGINEERING OPPORTUNITIES Northants

Our Client, market leaders in the provision of turnkey systems to interactive graphic and CAD applications, have seen a marked growth in their Client base and are now able to offer two unique career opportunities.

As sole UK distributors of leading interactive systems used across a diverse Client base in Industry, commerce and public utility Organisations, the engineering facility is a vital factor in their success. Utilising the latest systems innovations which include VAX, 11/23, H.P. and M8800 technology, and with a planned development policy coupled to continuous evaluation of market and product availability, they fully intend to sustain their established reputation for technical excellence.

To support this, they now seek to appoint two key people into critical positions, in order to further improve the provision of a complete and efficient engineering facility servicing installations involving critical production areas.

Service Manager

£15,000 + incentives 2 Litre Car

Your task will be to further develop and implement a Service Organisation on a system basis, to support users where down time is critical.

Able to demonstrate a solid technical career encompassing both hardware and software experience, you will lead from the front a competent engineering staff.

Experience in graphic/CAD facilities would be advantageous, but more critical is your ability to implement effective Management controls and supply technical and motivational leadership to your staff.

Providing support services from centre, phone support will play a major part, though you should be prepared to take on site visits personally if required.

To apply, candidates should possess a minimum education standard of HND (preferably a Degree) and be able to demonstrate a career to date that proves technical competence and the ability to assimilate new skills. By contributing to the growth of the Company, you can be assured of personal benefit and excellent career opportunities. Full induction and product training, together with generous incentives and benefits, including pension, private health plan and full expenses, indicate the environment. Full relocation assistance is available where necessary.

Candidates should contact the Advising Consultant, Brian Harris, on 021 236 3781 (24 hour answering service) or send current resumes to the Birmingham address shown below as soon as possible.

Technical Sales & Management Appointments

Specialist Computer Recruitment Ltd

SOUTH
James House, 46 James Street
London W1M 6HS
01-435 9871/486 0481

MIDLANDS & INTERNATIONAL
35-37 Great Charles Street
Queensway, Birmingham B5 3JY
021-236 3781

NORTH
International House, 84 Deansgate
Manchester M3 3EE
061-434 8427

BELGIUM
Avenue Louise 327
B-1050 Brussels
010 32-240 7161/71

HOLLAND
Willemsoordweg 92
1071 H.M. Amsterdam
010 31-20-760847

LANGTON

Langton Electronic Publishing Systems Limited is an established but fast expanding systems house specialising in information management.

As a stable and profitable organisation they cover areas such as text and graphics, demand printing, viewdata, on-line retrieval systems, optical and video discs and computer assisted retrieval and delivery systems.

TECHNICAL SUPPORT ANALYST UP TO £14,000

As part of their expansion plan they now require a technical support analyst.

You will be involved in the installation and support of electronic publishing software products, including trouble-shooting on customer sites.

The position will require some travelling to Europe and potentially North America.

Ideally your background will include eighteen months plus experience in a development or support environment with exposure in IBM VM.

EXCELLENT BENEFITS PACKAGE

- * Bonus Scheme
- * Interest Free Season Ticket Loan
- * Pension Scheme
- * Flexitime

For an informal discussion regarding this opportunity please telephone Miles Richards on 01-838 1804 (24 hours) or 01-047 2305 (7pm - 8pm).

Information Processing People
Specialist Recruitment Consultants
20 Kensington Church Street, London W8 4EP
Telephone 01-838 1804 Telex 22861

DALROTH

SAUDI ARABIA TAX FREE £19,000-£32,000

IBM · DEC · WANG

Commercial or T.P. Network Expertise

The skills currently required to maintain the thrust of new development now urgently include personnel from areas of medium size mainframes and small computing systems backgrounds.

You will be working within a computing environment internationally recognised for the development of their state-of-the-art equipment and facilities; socially you will discover that located in the Arabian Gulf leisure and sports activities are also almost without limit.

The standard consultant's package includes free flights, accommodation and Medicare. This together with the generous tax-free salaries available, can provide an opportunity beneficial to candidates with the following backgrounds:

1. SYSTEMS ANALYST/TRAINER

— specific responsibilities will include analysis and design together with the training of applications oriented personnel working in DEC/VAX based systems.

2. SYSTEMS PROGRAMMER

— main responsibilities will include DEC/VAX hardware installation and software development for network systems.

3. SYSTEMS ENGINEER

— installation and software support for WANG systems including SNA interface to IBM hardware.

4. PROGRAMMER/ANALYSTS

— to maintain and/or develop medium size mainframe business applications for conversion to run on a P.C. network for which PL/1, MVS, JCL, extended SP/ and Mark IV is required. Knowledge of IBM P.C. and Micro networking/multi user operating systems with mini/micro networking hardware/software preferred.

5. ANALYSTS/CONSULTANTS

— Information Technology. To provide professional technical consulting in the application of information technology within user organisations. Knowledge of IBM, WANG or DEC hardware/software with recent experience in project management is required.

6. SYSTEMS ANALYSTS

— Office Systems. Experienced in office systems fields with knowledge of applications for IBM/DEC/WANG small computers, more recently in the design, analysis and control of office systems with emphasis on work processing/data processing or micro systems.

7. SENIOR ANALYSTS

— Risk/Benefits Analysts. With long range planning and risk/benefit analysis experience required to liaise at senior level for applications planning. Knowledge of mini/micro business applications an advantage.

8. ANALYST PROGRAMMERS

— APL1 programming background is essential. Ideally including IMS, TSO/SPF, ADF on large IBM mainframe hardware.

The start dates are flexible, however, the client requires interviews scheduled over the next few weeks for which you should contact Geraldine Tee on day, 01-493 2947 or evenings/weekends 01-466 2326 without delay for further application details quoting ref. 5057.

DALROTH & PARTNERS LTD. 4 HALF MOON STREET, LONDON W1
Tel: 01-493 2947

NETWORK CONTROLLERS

LONDON SW17

£6,712-£11,873

South West Thames Regional Health Authority have a requirement for experienced Network Controllers to join a rapidly expanding group dealing with the installation, maintenance and administration of a fast growing communications network. Candidates should have a minimum of six months' experience working within a network control environment and be conversant with equipment, principles and conventions relating to such an environment. He/she will also have experience of liaising with British Telecom and suppliers and users of telecommunications and terminal equipment. The positions will initially be days only but extended hours working may be required in the future.

Appointments will be made at a grade and salary level appropriate to the applicant's experience and qualifications.

For further details contact:

Kelth Fox
Communications Network Manager
S.W.T.R.H.A.
Regional Computer Centre
Springfield Hospital
Glenburnie Road
Tooting, London SW17 7DJ. 01-672 9988

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Earn between £10K and £14K Basic + O.T. + Standby
Drive a 2-litre GL company car - private petrol field

Field Service Engineers with a good knowledge of mini/mainframes are offered the opportunity to work for this world-leading manufacturer of non-stop processing microcomputer equipment.

INTERESTED IN CAD/CAM?

Basic Salaries to £11K + 2-litres car + all benefits
Substantial growth (60% p.a.) has now created a number of vacancies throughout the UK. Our client can proudly boast that they are the world leaders in the manufacture of CAD/CAM mini-computer systems.

JUST STARTING OUT?

Working, Essex, Scotland, Hertfordshire
Would you like the opportunity to get your foot in the door of the computer industry? Our Client, a major micro manufacturer can give you the key.

Phone JACKIE WOOD on 01-543 4844 days or 0403-586899 Even/Weekends

ALLTRONICS PEOPLE (AGY)

Control/Application Engineer

Bingham - Notts.

A current vacancy exists for an industrial control engineer, with a thorough knowledge of programmable controllers or microprocessors.

Ideally qualified to degree level, although ONC/HNC/HND qualifications with the relevant experience will be considered, the ability to program in ladder logic is an essential requirement. Additional knowledge of a computer language and/or in-depth experience of Allen Bradley, Modicon, IPC or GEC programmable controllers would be a distinct advantage.

We have a major involvement in the application of computers, graphic equipment, programmable controllers and communication networks to most industrial process control systems. In addition, we have the expertise to handle all facets of control, from conception through to customer acceptance.

Candidates must be dedicated and capable of working independently both at base in the highly attractive market town of Bingham and on occasional overseas assignments.

Salary is negotiable with benefits appropriate to a company of our standing.

If you feel that you can meet the requirements of this position, we look forward to hearing from you. Send a cv to Peter R. Clark, Haden Automation Systems Limited, P.O. Box 14, 7-12 Tavistock Square, London WC1H 9UZ.

Haden

HADEN AUTOMATION
SYSTEMS LIMITED

Systems Analyst

£9,060-£10,539 p.a.

Our installation is based on two ICL 2966 computers with an extensive County wide network of ME296, DR6 micros and over 180 terminals. Both DME and VME operating systems are currently supported. We are committed to an extensive development plan centred on VME and one of the new projects we are undertaking is a Personnel system. A systems analyst is required to take a key role in the development of this project.

To satisfy existing requirements you must have at least five years' relevant experience with an in-depth knowledge of analysis and design having been at least one large project through to implementation. You must have a thorough knowledge of VME, DMS and DR6 is essential.

For further information contact Ian Harris on Truro 71795 or obtain an application form from The County Treasurer, County Hall, Truro, Cornwall TR1 3BD.

Closing date: April 2, 1984.

Cornwall

1-2 YEARS' PROGRAMMING? HOW ABOUT VAX? (and others)

Come and talk to us about developing your skills by helping in software applications package development for on-line distribution systems.

Salary will not present a problem for the right applicants and a profit sharing scheme is in operation. Send a brief CV or, preferably, phone Tony Fowler or David Elsie at:

AFT

Kemp House
162/164 City Road
London EC1
01-251 0661

UNIVERSITY OF READING COMPUTER CENTRE SYSTEMS PROGRAMMER

A Systems Programmer is required to join the group developing and maintaining systems software within the Computing Service. The Centre operates an Amstrad V17A, running VME/CMS and TRS and 3 Norad Data machines, plus an extensive VME campus packet-switched network. The Centre is also connected to the National Centre at London and Manchester. The Programmer's main duties will be in the VME/CMS group and system would be the advantage. Applicants should possess a degree and relevant postgraduate experience. The post is a permanent one on either Grade 1A (£17,100-£17,615 p.a.) or Grade 2 (£17,100-£17,615 p.a.), according to experience. The post carries a 10% superannuation. Apply, quoting Ref. N.V.A., to: Personnel Office, University of Reading, Whiteknights, Reading RG6 2AH. Closing date 20.3.84.

EPSON

OPEN DAY

MARCH 20th

READING



EPSON cordially invite you to after-work refreshments at the Ramada Hotel, Oxford Road, Reading, Berkshire, on Tuesday March 20th. Not only refreshments but the chance to discuss what could be the most important career development opportunity for you so far.

EPSON have the largest share of the world market for Mini-printers, Dot matrix printers, and LCD's. We are also manufacturers of the HX20, the top selling business portable computer in the UK and are rapidly expanding our penetration of the desk top micro-computer market.

Since 1979, the annual turnover of the UK operation has risen to over £30M including a growth rate of well over 250% in the last year. This has been achieved by the relentless pursuit of excellence at every level from research and development through production to marketing.

We are now planning to launch many new and innovative products in the next 12 months and offer exceptional ground floor opportunities for specialist personnel at our UK headquarters in Wembley.

- * Software Development Specialists - with UNIX, C/P or MS/DOS, PASCAL, C, Z80 and 8086 experience.
- * Operations System controller (VAX 750) with experience of a UNIX and LAN development environment.
- * Technical Support Specialists - Applications - Software with Basic and C/P.
- * Technical Support Specialists - Hardware - with micro and peripherals experience.
- * Senior Service Engineers - with inhouse and field service experience.
- * Technical Trainer - Hardware/Software with qualified training background.
- * Technical Product Managers for Printer and OEM products.
- * Technical Author.
- * Systems 34/36 Manager with ops, analyst/programming experience.

We look forward to seeing you on the 20th. If you have any queries please call our advising consultants, Craig Millar or Karen Whelan on 01-637 9611, or send your C.V. to the address below.

Suite 201-208 Albany House, 324 Regent Street, London W1R 0AA

MANAGEMENT &
EXECUTIVE SELECTION

4 pm
until
9 pm

Cambridge Interactive Systems Ltd., is one of the industry's most exciting and fast growing CAD/CAM companies. They are totally committed to a continued programme of research and development in the area of CAD/CAM, particularly 3D Modelling Techniques, Numerically Controlled Machine Tools, Sophisticated Database Techniques and the broadening of applications from Mechanical, Electrical, Civil and Architectural Engineering into other areas of industry. They have in-house, large Prime and Vax Mini-computers dedicated to this development work and these are networked to a number of other machines within the organization. A wide variety of Graphics Display Equipment is installed for the development of Graphics Software.

To coincide with the introduction of a new and highly sophisticated range of Software products they have a need to recruit the following high calibre personnel:-

Medusa Product Support Manager £16,000

Responsible for the worldwide organization and support of the highly respected Medusa product, the successful candidate's responsibilities will include working closely with the development teams in the co-ordination and definition of product release schedules, liaison with customer field support organizations and the organization of training for field specialists. Additional responsibilities are the co-ordination of product development plans relating to marketing requirements, the organization of appropriate problems reporting and correction procedures and the co-ordination of product testing and documentation.

Development Programmers to £12,500

Applicants should have a good numerate degree, at least two years experience of programming in a technical environment, together with a good working knowledge of Fortran. Experience of Software development on VAX, Prime or Unix would be valuable as would previous exposure to CAD/CAM Software.

Applications Specialists £10,000 to £14,000

As part of the Marketing Group candidates will be responsible for promoting and exploiting Medusa in specific industry areas. The Applications Specialists will investigate market requirements in particular areas, specify enhancements to the system required by that market, liaise with the sales organizations and organize the production of special industry specific sales material, demonstration material and customization of Medusa.

Product Development Engineers to £12,000

As a Member of the Product Support Team you will be working closely with the Software Development Teams on the development, evaluation and testing of new CAD/CAM products. The post will include training field support staff in the use of new products together with developing appropriate user interface material such as menus, demonstration material and on-line instructional aids. Applicants should have at least two years experience of practical engineering preferably in a Drawing Office, Mechanical Design or NC environment together with some experience of working with Technical Software.

Technical Authors £10,000 to £14,000

Developing the technical documentation, training material and other support aids for CIS's wide range of CAD/CAM products. Candidates will be working closely alongside the efforts of the Software Development Teams. You will have a fairly deep understanding of both the Software being documented as well as the Drawing Office environment in which it will be used. Consideration will be given both to applicants who have previous documentation experience as well as those who have substantial experience in Engineering, Software Development or Field Support of CAD/CAM Systems.

For all of the above positions it is envisaged that applicants will be educated to either HND or Degree level, have substantial practical experience in a specific industry area such as Civil Engineering, Plant Design, Architectural, or Electrical Engineering together with a knowledge of current CAD/CAM technology. In addition to the excellent salaries and bonus offered, these positions represent unique opportunities to join a Company whose success to date far outstrips any of its nearest rivals.

CIS
Medusa

Please contact: David Hendry,
CADsearch, London House,
271-273 King Street, London W6 9LZ.
Telephone: 01-741 8011
(eves 01-748 1987/1975/2160)
or home no: 0784 52312.

Are you
big enough to take
the next step?

CADsearch

SALES EXECUTIVE

High Basic Salary and Performance Related Earnings Leading to a Package:

c. £30,000 p.a. Plus Benefits and Car
Location - Bristol

The Company

We are one of the leading systems houses in the West Country, involved in supplying bespoke software on a project or turnkey basis to local companies. We have an impressive reputation, excellent capital funding and a sound development base from which to launch our future growth.

The Requirement

Due to the continuing expansion of our business we are eager to recruit an additional sales executive who will be closely involved with our management team in meeting the targets for expansion that we have set for the next 5 years. We consider it to be essential that prospective candidates should be able to demonstrate a successful track record and a thorough understanding of selling business solutions within the computer industry. They should be self motivated business men or women with an innate understanding of how to manage and meet individual and corporate goals.

The Job

Together with senior management, the successful candidate will be involved in developing our current sales strategy by building on the foundations of previous successes and initiating the contacts and procedures necessary for new business sales. The candidate will be able to draw on internal resources for all necessary support and guidance when presenting solutions to potential clients.

Location

We are based in Central Bristol close to Temple Meads Station with convenient car parking nearby.

For Further Details

Please contact our Branch Manager, Peter Johnston on 0272-215286 (office hours) or Malmesbury (0666) 840787 (evenings & weekends). He will be pleased to discuss this position further and to arrange for you to receive some background information about our company.

**TOTAL
SYSTEMS (Western)
LIMITED**

33-49 Victoria Street, Bristol BS1 6AD

0272 215286

Project Leader

Negotiable Salary

This position has arisen due to the increasing demands on the time of the Project Development Manager and the person selected will deputise for him in his absence. Candidates should have about 7 years' strong IBM experience and have been responsible for at least one major project. A good commercial background is essential and knowledge of library systems would be an advantage. Exposure to IDMS and Shadow II would be an asset.

IBM and DEC Installation

The organisation utilises large IBM hardware and multiple DEC computers and several on-line database systems are operational. In addition, a network with distributed databases at its offices in North and South America and Europe is being set up. COBOL is the main programming language.

Working Environment

The development team comprises a number of experienced analyst programmers who work individually on projects or combine into small project teams as the need arises. A high proportion of the staff is British and English is the working language of the installation.

Living in Holland

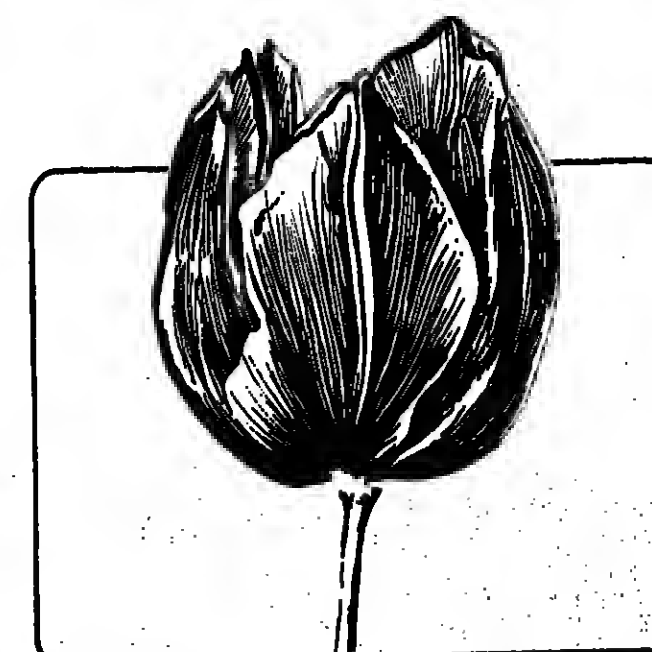
Many British computer staff work in Holland and it is in many ways the "softest landing" for those who wish to move to continental Europe. The client is located in a small town near the coast and accommodation in the area is not difficult to find.

Relocation

A generous relocation package is offered to help candidates and their families settle in satisfactorily.

English, as well as being the working language of the installation, is generally spoken throughout Holland, which considerably eases settling-in problems.

HOLLAND



**Analyst/
Programmer
Library Systems
£11-£17,000**

This opening offers the opportunity to become involved in important development work with strong emphasis on analysis. The ideal candidate should have between 3 and 5 years' analysis and programming experience, preferably in a DEC environment, although IBM would be acceptable. A good knowledge of COBOL is required together with a strong technical background. Experience of library systems is essential.



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5 Hospital Street
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Cheshire
(0270) 627 206

Interviews

Initial interviews with the client's representatives will be held in the UK during April.

For an initial discussion, ring me, Alison Jary, on (0270) 627206 office hours or (0270) 625436 other times, or write to me at the address opposite.

Contractors – What Will It Be? £ ----

No – we are not aiming for a mass rates explosion but our clients are in need of freelance programming and analytical support and the remuneration is very attractive. Naturally, we would be more than interested to hear from any contractor who is now or shortly to be available but in particular our requirements are as follows:

- Programmers with PL/I, IMS DB/DC and JSP experience
- Programmers with NCR mini/mainframe, IMOS/IRX/VRX and COBOL experience
- Programmers with Univac OS1100, DMS, TIP and COBOL experience
- Analysis and analyst/programmers with banking/financial systems experience, preferably gained in an IBM mainframe environment.

Our clients are predominantly large organisations in the banking and insurance sectors who have extensive development plans and who offer excellent working conditions.

Please send your CV or telephone Barrie Frost

ACR Allmand Computer Resources Ltd
15/17 City Road, London EC1Y 1AA.
Telephones: 01 820 0801 (24 hr)
Doe Ltd. No. SE 6663

REAL TIME SOFTWARE UP TO £18K + BENEFITS STAINES BASED

We are the Technical Division of an expanding systems consultancy and seek software professionals to lead a further penetration of our existing and new market sections.

Defence Systems
Process/Industrial
Banking

Advanced Communications
Cable TV
High Integrity Systems

Senior staff must be self-reliant, consultancy orientated and be capable of high levels of interaction with the sales team to develop new business. We also welcome applications from Systems and Software Engineers with a minimum of three years' relevant industrial experience:-

PDP/VAX GEC 4000 ZYLOG MOTOROLA
FERRANTI INTEL Coral 'C' ADA Poscol
PLM

Mini and Micro experience not covered above may still be relevant.

All candidates must be mobile, committed and willing to work at client sites within commuting distance of Staines. Some opportunities for work also exist on the Hampshire coast. Whilst the candidates should preferably live in the A3/M3/M4/M25 belt, relocation packages will be considered on all levels.

Benefits include competitive salary, free PPP, Life Assurance and Pension Scheme, Training Programme and the opportunity to grow with a young and rapidly expanding company.

Phone Geoff Dongworth on Staines (0784) 83811 or Barrie Kemble on Staines (0784) 86601.

Alternatively phone Geoff Dongworth at home on Hookwood (028678) 8307 or write to him at Cord Designs Limited, Cord House, The Causeway, Staines, Middlesex TW18 3AX.



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ZEUS HERMES DIVISION

(8044)

SMR

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SALES EXECUTIVES FREEDOM TO BREATHE, ROOM TO GROW!

Many sales people never reach their full potential, because they are constantly frustrated by executive whim or stifled by corporate edict. How nice it is, therefore, to make available such jobs as these in

SOUTH EAST ENGLAND and the WEST MIDLANDS

that not only provide a 'ground-floor' opportunity within a fast growing and progressive organisation, but which also give the individual salesperson freedom of action, scope for creative selling and real involvement in shaping the destiny of the company.

Our client is a well-established name in both minicomputer-based turnkey systems and computer terminals and have secured some 25% of their specialist market. Such is the success, that all of their existing salespeople consistently achieve target. This is most likely due to the company's unusually high investment in advertising.

We are seeking three accomplished salespeople; one with significant experience of selling DEC-based commercial and Industrial Turnkey Systems up to a value of say £200k, and two with a good track-record of selling Computer Terminals. In the former case, a pre-sales support analyst would also be considered. In the latter case, some exposure to DEC equipment will be advantageous, but not imperative, whereas a proven ability to communicate at a senior level is essential in both instances.

An attractive compensation package is negotiable, including a company car and a variety of fringe benefits with on target earnings of £22,000.

Please contact Lindaay Howie (London) or Roger Dodd (Midlands), quoting reference HSC/024.

(8328)

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London W1. (01) 734 9776

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TO £13,000 + BENEFITS

TRAINING GIVEN FROM RPG II

My client is a market leader in the manufacture and distribution of catering products. With a multi-million pound annual turnover they are recognised throughout the industry for both quality and reliability.

As an experienced analyst/programmer you will control the day to day running of the department with three personnel reporting to you. Responsibilities will include maintaining and developing existing programs and developing new systems for both short and long term requirements. As a professional you will be contributing to future growth and success. As a member of a team playing an important role within the company.

You will need to be self-motivated and able to work without supervision. Good communication skills are essential with the ability to be diplomatic with users at all levels. Every opportunity will be given to develop your technical ability with training courses.

For further information please call Richard Milsum on 01-354 1055 during office hours or on 01-958 2553 in the evenings or weekends. Alternatively please send full details to:

MARCH 1 NOEL ROAD, LONDON N1 8HQ
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SALES BIT

Installing a system is no small business for optimism

AS one who has sold a lot of business systems in his time, involving a variety of solutions from the installation of mainframe computers to the use of service bureau facilities, recently I have sustained the cultural shock of installing a microcomputer-based system for controlling company accounts.

What a revelation it has been, not only in terms of our own accounting procedures, but also in the realisation of the potential problems for small businesses which today are installing such systems without the benefit of understanding computers, appreciating systems design and, in many cases, having no full-time accountant to sort out the errors and exceptions that inevitably come to the surface when a computer is put into effect.

I am constantly horrified by the exploitation of the enormous gap between superficial knowledge and total ignorance that is possible in some sections of the computer industry, but particularly where microcomputer-based small business systems are concerned

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between superficial knowledge and total ignorance that is possible in some sections of the computer industry, but particularly where microcomputer-based small business systems are concerned.

The scope and power of the computer, for the greater proportion of the population, is now a well-established component of every day mythology. It is the ultimate panacea; a cure-all for even the blackest business malady.

One probably has to be an established user or supplier before really appreciating the fallibility and limitations of the computer as an electronic saviour. However, there are still salesmen in our midst who see the small business computer in particular with rose-tinted optimism.

One of the biggest dangers for the first-time user of, say, a microcomputer-based system for commercial accounting, is the implied suggestion that a person who is fluent with the facilities and mechanism of a commercial accounting system must also be completely aware of accounting practice and have immediate understanding of the existing accounting procedure that is being converted to computer processing.

This is not necessarily so on even often – the ease. A post-sales support analyst should be able to advise the end-user on how the data should be prepared and entered into the system, advise on data processing disciplines, and show the user how to use the various facilities available. But seldom will the advisor be able to affect that data processing truism that garbage in equals garbage out.

After all, the analyst's job is to ensure that the system is processing that data presented to it in the prescribed manner.

It is not his job to qualify the balances brought forward from past financial years, question the analysis of purchase invoices, quantify the effects of previous mis-statements, query the matching of payments with ledger items, and so on. He asks the end-user for the facts, and unless something is obviously amiss, assumes them to be correct.

Even if he had a good basic instinct for figures, it is unlikely to

be of any significant value unless he has had prolonged exposure to the client's accounting procedure. And few, if any, turnkey systems houses have time for such non-chargeable niceties.

It felt rather odd having to make a decision about which computer system I should install. As a salesman with a good inside knowledge of the business, a fairly comprehensive knowledge of the kit and software available, over 20 years' experience of commercial data processing and business management and, through sales and technical staff recruitment for the supplier sector, in regular contact with a host of companies with the resources to solve any problem, it was obviously much easier for me than the maiden user to get to know what was possible and select the most appropriate short-list of suppliers.

Not a bit of it! The more alternative I considered, the more they looked the same.

There were so many possibilities and permutations that their interaction served only to confuse. I found myself in a "Gordian Knot" situation where the only way to untangle my deliberations was to cut it straight through the middle with a piece of pragmatic logic.

Having operated a manual accounting system for over eight years, I figured there were bound to be some problems with mis-postings, wrong analysis, compensating errors and the like, and the computer was bound to bring a few "nasties" to the surface.

So, I figured I didn't so much need an analyst/programmer as an accountant to handle the challenge of dragging us into the world of electronic data processing.

I made a few enquiries in the locality of our Lichfield office to see if any of the local turnkey outfits employed qualified accountants as well as computer technicians. I soon discovered that this was not a common phenomenon.

But I eventually made contact with Robert Jones of Peach Data in Burton-on-Trent, himself a chartered accountant, and asked him over for a discussion on what his company could do for us.

He was soon able to identify areas of improvement in our procedures and report and pinpoint some of the eccentricities of previous book-keepers. We ironed out each problem as it arose and it was not long before the first profit and loss account was proudly presented to me.

The conditioning of a deprived youth coupled with the discipline of many years service with American corporations made me instinctively look at the figure in the bottom right-hand corner.

I knew instinctively that it was completely wrong!

PUZZLE ANSWER
THE square of (n+1) is always (2n+1) greater than n². So 1,984² must be: 3,936,256 + (2 × 1,984) + 1 = 3,940,225.

Alan Williams